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## The Relationship of Social and Maturational Variables to Development of Field-Dependence in Preschoolers: A Longitudinal Study

Elizabeth S. Baraga

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THE RELATIONSHIP OF SOCIAL AND MATURATIONAL VARIABLES TO DEVELOPMENT  
OF FIELD-DEPENDENCE IN PRESCHOOLERS: A LONGITUDINAL STUDY

by

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Bachelor of Arts, University of North Dakota, 1971  
Master of Arts, University of North Dakota, 1975

A Dissertation

Submitted to the Graduate Faculty

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in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

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1977

This dissertation submitted by Elizabeth S. Baraga in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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Permission

THE RELATIONSHIP OF SOCIAL AND MATURATIONAL VARIABLES TO DEVELOP-  
Title MENT OF FIELD-DEPENDENCE IN PRESCHOOLERS: A LONGITUDINAL STUDY

Department Psychology

Degree Doctor of Philosophy

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Signature Cheryl A. Dwyer

Date July 7, 1977



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## ABSTRACT

This study was an initial attempt to relate theoretically and empirically three heretofore independent developmental concepts-- differentiation, attachment and competence. Borrowing from Mahler's thesis of separation-individuation, differentiation is thought to be a process which begins when the child separates himself from mother. It is hypothesized that differentiation begins at about six months within the context of a mother-child symbiotic relationship.

Once the infant has formed initial body boundaries he is then capable of forming a specific bond to his primary caretaker. This mother-child bonding has been labelled attachment by other theorists and is hypothesized to occur at about 9 months. Moreover, the quality of this attachment, which is determined by both infant and maternal variables, has been shown to relate to amount and quality of exploration as well as to cognitive growth.

Individuation consists of those achievements marking the assumption of the child's own individual characteristics. It is the evaluation of autonomy, perception, memory, cognition and reality testing. As a process, individuation is considered separate but intertwined with separation, reaching maturity at 3 years of age. Since this is relatively late in the ongoing process of growth and maturation, it is assumed to be affected by and related to the earlier accomplishments of differentiation and attachment.

Specifically, it was hypothesized that infant attachment behavior at age one and maternal personality variables would be predictive of attachment behavior, competency skills and degree of psychological differentiation at age three. These three latter variables were also expected to be significantly interrelated. Furthermore, infants grouped at age one according to the quality of the mother-child bond were expected to have significant differences in 3-year old degree of differentiation.

Subjects were 19 child-mother pairs who were observed in a laboratory situation at one and 3 years of age. The procedure consisted of 5 conditions where mother was present and unoccupied, a stranger was present, the child was alone, mother and child were reunited after separations and mother was present but occupied. Both exploration and social interactional behavioral frequencies were obtained. At the time of the first observation, mothers completed the Edwards Personal Preference Scale (EPPS). Also, resulting from codings of the first observation the infants were classified as either insecurely attached, securely attached or detached. At the time of the second observation mothers completed the Minnesota Child Development Scale (MCDD). Also, the Preschool Embedded Figures Test (PEFT), a measure of field-dependence, was individually administered to each child.

As predicted, there were significant differences in field-dependence between the two extreme quality of attachment groups, the detached group being more differentiated than the insecure attachment group. Factor analyses of the laboratory situation behaviors resulted in individual factor scores which were utilized in further analyses. Multiple linear regression analyses, predicting age three from age one



variables were nonsignificant. Also nonsignificant were multiple regression analyses relating age three factor scores and MCDI measures to field-dependence.

Paradoxically, the individual significant relationships of field-dependence to other variables indicated that it was related to both functioning independently from mother and to advanced development. Although maternal autonomy was positively correlated to field-independence, it had its own negative relationships to these variables. Given the relationship of field-dependence to one-year-old insecure attachment, these relationships were expected to be in the direction opposite to what was found.

These findings were discussed within the framework of Mahler's theory, specifically the rapprochement crisis. Also presented was a discussion of field-dependence as a measure of perceptual-cognitive development and its possible relationship to early maturation.

## CHAPTER I

### INTRODUCTION

In 1975, Mahler, Pine and Bergman published a major theoretical treatise, The Psychological Birth of the Human Infant. They referred to this "birth" as a separation-individuation process which was conceived as two complementary developments. "Separation consists of the child's emergence from a symbiotic fusion with the mother, and individuation consists of those achievements marking the child's assumption of his own individual characteristics" (p. 4). The separation-individuation process thus begins at biological birth and ends with psychological birth at approximately three years of age.

Furthermore, these authors postulate three interrelated developments which contribute to the child's first awareness of separateness and movement towards individuation. These are (1) body differentiation from mother, (2) establishment of a specific bond with her, and (3) the growth and functioning of autonomous ego apparatuses.

These three developments have been independently observed and discussed elsewhere. Body differentiation from mother has been previously theorized as a beginning of the ongoing process of psychological differentiation; the degree of which has important implications for other areas of functioning (Witkin, Dyk, Faterson, Goodenough and Karp, 1962). The establishment of a specific bond with mother has been labelled as attachment by Bowlby (1958, 1969). As such, this development has generated extensive research by Ainsworth and her



colleagues (Ainsworth & Bell, 1970; Ainsworth, Bell & Stayton, 1971; Ainsworth & Wittig, 1969). Lastly, the growth and functioning of autonomous ego apparatuses is similar to what recent authors have discussed under the rubric of "competence" (White, 1972; Bronson, 1974).

Mahler's work (1975), although including these three developments as important stepping stones to completion of separation-individuation, does not attempt to integrate the similar theoretical and empirical work done in separate areas. Yet, in light of the existing likenesses between these postulated developments and other empirically supported theories, it would seem valuable to do this.

Therefore, the present work had two purposes. It was first an initial attempt to tie together theoretical assumptions and empirical data associated with the development of psychological differentiation, attachment and competence, utilizing Mahler's framework of separation-individuation. A second purpose of this study was to gather empirical data supporting their proposed interrelationships in early development. Since psychological birth is purported to be a three year process, a longitudinal study is the method of choice and was utilized here.



## CHAPTER II

### THEORETICAL OVERVIEW

#### Separation: Differentiation

According to Mahler and her associates (1975) the psychological birth of the individual can be considered a separation-individuation process. Before this process occurs the infant has traversed two phases considered "forerunners." These are the normal autistic phase and the normal symbiotic phase. The former phase is characterized by the infant's unresponsiveness to outside stimuli. It ends in the second month of life when the infant becomes aware of the need satisfying stimulus. This achievement marks the beginning of symbiosis, that is, the infant functions as if he and mother shared common boundaries.

Normal symbiosis describes the infant's initial state of undifferentiation. The child's image of self is fused with that of mother and inside and outside are only gradually sensed as different. Mahler hypothesizes that during the symbiotic phase it is important that the infant have constant close contact with mother to gain familiarity with her as a separate but "good" object. In addition, she states that when inner pleasure is maintained (due to safeness with mother and freedom from hunger and pain) externally-directed attention can be increased. Differentiation occurs out of this latter development.

At about six months, as outlined by Mahler et al. (1975), the infant begins to separate from mother, to differentiate. This is behaviorally illustrated by the infant's manual, visual and tactile



exploration of the mother and the environment. At about 7-8 months the infant begins "checking back to mother" which is hypothesized to be "the most important fairly regular sign of beginning somatopsychic differentiation" and "the most important normal pattern of cognitive and emotional development" (Mahler et al., 1975, p. 55).

Differentiation of self from mother at this stage is further hypothesized to have important implications for later development. These authors maintain that if the child did not develop basic trust during the symbiotic phase, acute stranger anxiety may occur when the infant first recognizes the unfamiliar. Also, if the symbiotic relationship has been for some reason disturbed (e.g., mother is depressed or ambivalent over the infant's dependency) the process of differentiation becomes delayed or even premature. Furthermore, optimal development throughout the phases of separation-individuation seems to occur when awareness of bodily separation from mother goes hand in hand with development of independent autonomous functioning, e.g., cognition, perception, memory and reality testing.

Differentiation as explained by Mahler and her associates is very similar to that construct as defined by Witkin and his associates (1962). For the latter authors a high level of differentiation in a psychological system implies clear separation of what is identified as belonging to the self and what is identified as external to the self. Early development of differentiation consists of the child's growing awareness of differences between the body and the outer world. Also, the infant moves away from the initial state of unity with the mother towards a greater degree of separation. He thus achieves a sense of separate identity and the self becomes more differentiated as it develops.



Like Mahler et al. (1975), Witkin et al. (1962) hypothesized implications of the development of differentiation for other areas of development. For example, they hypothesized that greater differentiation is manifested in the kind of controls and defenses one attains for the channeling of impulses and expenditure of energy. "The differentiation hypothesis" which is proposed by Witkin et al. (1962) assumes that there exists an association among characteristics which imply greater or more limited differentiation, these being

. . . degree of articulation of experience of the world; degree of articulation of experience of the self, reflected particularly in the nature of the body concept and extent of development of a sense of separate identity; and the extent of development of specialized structured controls and defenses (p. 16).

This hypothesis is testable by the implication that psychological differentiation is associated with greater articulation of one's perceptual external experience. This is labeled as "perceptual style," or "field-dependence, independence."

This initial work of Witkin and his associates provided a valuable contribution by linking theory of personality and psychopathology with laboratory research on perception and cognition. Moreover, they provided initial construct validation and developed empirical tools to measure field-dependence, independence.

It was hypothesized that there exist individual measurable differences in field-dependence, independence which are associated with the extent and integration of one's psychological differentiation. To the extent that one adopts an analytical field approach and is able to overcome an embedding context and to experience items as discrete from the field in which they are contained, he is field-independent. To the



extent that one adopts a global field approach and is submissible to the dominant organization of the field and tends to experience items as fused with their background, he is field-dependent. The three tests which were devised to measure this construct were the rod-and-frame test (RFT), the tilting-room-tilting-chair tests (TRTC) and the embedded figures test (EFT) (Witkin et al., 1962). The EFT has also been revised downward so that it is suitable for young school-aged children (Children Embedded Figures Test, Karp & Konstadt, 1971) and also for preschoolers (Preschool Embedded Figures Test, Coates, 1972).

This differentiation hypothesis as adopted by Witkin and his associates generated much research. However, most of this has been done with adults and there has been little evaluation of the original theory itself (Wachtel, 1972). Even though the theory has many implications for developmental research, there are few studies done with the younger age groups. Most of what has been done using children as subjects has been aimed at examining relationships between field-dependency and perceptual-cognitive abilities (Fleck, 1972; Bowd, 1974b, Goodenough, 1976).

Pertinent theoretical examination of the implications of psychological differentiation for separateness from mother and integration of self-concept is rare. Nor is there much in the way of predicting other early childhood developments and behaviors from degree of differentiation. Witkin himself reported initially that field-dependence is, in fact, associated with one's early articulation of body concept and stability of self-view (Witkin et al., 1962). Escalona and Heider's major work, Prediction and Outcome (1959) provides tangential evidence of the differentiation hypothesis. She and her colleagues found reliable individual



differences in the infant's use of space and these significantly predicted the child's subsequent movement in space as well as later tendencies to impose structure on space. Moreover, this was also predictive of developmental patterns of motor development (gross versus fine), attention and skillfulness in social interactions. Available work done with preschoolers has indicated interesting relationships of field-dependence, independence to other social and cognitive variables. More specifically, field independence has been found to be related to preferences for non-social play, perceptual orientation to inanimate objects, achievement, orientation, and eagerness to learn new things; field dependence is indicative of preference for social play, perceptual orientation to people and dependency strivings (Beller, 1958; Coates, 1972; Coates, Lord & Jakabovics, 1975).

Research done with older groups indicates further that field independent children differ from their counterparts in that they are better able to structure their experiences, show greater cognitive clarity, and have relatively impersonal and intellectual approaches to problems. They are less dependent on adults for guidance, are regarded by others as more socially independent, and they show less interest and need for people. They are also less influenced by authority (Witkin et al., 1962), and have greater self-esteem (Pawelkiewicz & McIntire, 1975). Furthermore, cultures which emphasize autonomy and independence are found to have more field independent children than cultures which stress social conformity (Witkin, Price-Williams, Bertini, Christiansen, Oltman, Ramirez & Van Meel, 1974).

Although field independence increases with age (Witkin et al., 1962; Vaught, Pittman & Roodin, 1975), individual differences appear stable

over time (Witkin et al., 1962; Coates, 1972; Bowd, 1974a). Also, there are reported sex differences in this measure. By the age of five, girls are more field independent than boys (Coates, 1974) but the rate of change increases more rapidly with boys than girls (Vaught, Pittman & Roodin, 1975) so that by adolescence boys have become more field independent (Witkin et al., 1962). At the preschool age, field independence is more highly correlated with achievement strivings in girls than boys, although the direction of the relationships is the same for both groups. With the WPPSI vocabulary score partialled out, female field independence at the ages of 3, 4 and 5 was found to be significantly positively correlated to independence, goal direction, activity initiation, creativity, and enjoyment in activities; it was negatively correlated to requiring direction, distractibility and frustration (Coates, 1972).

Field-dependence thus appears to be related to dependency in people due to its consistent correlation with preference for an interpersonal mode of interaction; that is, reliance on people versus things. This makes theoretical sense in that field dependency, which indicates lesser psychological differentiation, would also therefore indicate a less defined body image or self-concept. This would rationally be associated with a tendency to rely on others to provide self-definition and boundaries.

Research in other areas has shown that preschoolers do, in fact, exhibit reliable individual differences in their perceptual orientation and interactional preferences (Emmerich, 1964; Bronson, 1975; Jennings, 1975). Furthermore, perceptual orientation toward things has been shown to be associated with a greater ability on tests of organization and



classification, while people orientation was not associated with greater social knowledge or competence (Jennings, 1975). Preference for social play is also correlated to attention-seeking in a nursery school (Baer, 1962) and also seems to occur more in girls than boys (Coates, 1974). The adoption of an interpersonal versus impersonal mode of interaction appears stable over time (Emmerich, 1964; Schaefer, 1964) and is probably acquired as early as two years of age (Bronson, 1975).

Field dependency also appears to have implications for independent functioning with regard to its consistent correlation to autonomy and achievement strivings. Research in other areas has further indicated that achievement striving is observable at an early age (Appelton, Clifton & Goldberg, 1975) and is stable over time (Crandall, Preston & Robson, 1960; Schaefer, 1964; Murphy, 1962). Murphy (1962) concluded from work with the development of autonomy that a sense of self-reliance and independence correlated highly with the ability to organize and to provide one's own structure as well as with the tendency to use environmental areas selectively, giving further credence to the possible association between independence, autonomy and psychological differentiation.

In Murphy's study cited above, she observed adolescent sex-differences in the range of autonomous functioning due to the greater amount of dependency as shown by females. However, there have been a number of studies at the preschool level which indicate no reliable sex differences at the preschool level (Cramer, 1970; O'Connor, 1975; Crandall et al., 1960; Heathers, 1955). Yet Kagan and Moss (1962) have reported that measures of dependency were more stable from infancy to adulthood in females and Crandall et al. (1960) report that by the age



of six, girls behave more dependently than boys. Furthermore, Beller reports that there is more dependency conflict in boys than girls. These findings have further implications in terms of reported sex differences in extent of psychological differentiation. If psychological differentiation is thought of as a continuous process from less to more with stable individual differences occurring, then perhaps females initially differentiate more rapidly but due to other factors become more dependent on their environment and this in turn retards further successful differentiation. Males, on the other hand, differentiate at a slower pace, but due to more demands on them to be independent, experience more dependency conflict (Beller, 1958), yet become more autonomous and psychologically differentiated than females. Whatever the sex differences found in the later years, there seems to be no consistent sex differences reported for early preschool measures of psychological differentiation, dependence and autonomy.

In summary, work with psychological differentiation and young children has been greatly ignored. What has been done indicates an important relationship with differentiation and social dependency and autonomy. The constructs of dependency and independence have further implications for the development of competence. Surprisingly, what has been totally ignored in this area is the mother-child relationship and the degree of psychological differentiation. One tangential study by Goldstein and Peck (1973) reports a significant correlation between degree of differentiation found in children and their mothers. Yet if, as both Mahler and Witkin and their associates postulate, the process of differentiation begins as the child separates from mother, the early



mother-child relationship and interaction must also be intricately related. Therefore, it seems necessary, both for further theory validation and for the understanding of early infant development, to evaluate the relationship of mother-child interaction and early child differentiation.

#### Development of a Specific Bond: Attachment

The early mother-child relationship has been given much attention by social scientists. Looking at its earliest beginnings, Mahler et al. (1975) postulate that the infant must first gain some degree of differentiation, some sense of separateness, before it can develop a specific bond to one person. The reasons why such a specific bond are useful or necessary have been discussed elsewhere, as well as behavioral indices which illustrate that such a bond exists.

Bowlby (1958, 1969) and Ainsworth (1969, 1972), for example, invoke an ethological-evolutionary explanation for its development. Such an explanation emphasizes the functions of behaviors subsumed under attachment in relation to individual and species-survival. Bowlby (1969) regards attachment as "a class of social behavior of an importance equivalent to that of mating behavior and parental behavior. It is held to have a biological function specific to itself" (p. 179). Looking at attachment as the integration of behavioral systems such as crying and clinging, which when activated have proximity to mother as a predictable outcome, Bowlby hypothesizes that the potential to develop and integrate these systems is inherited. This potential would be advantageous for the young of a species since maintaining proximity to an adult would aid in protecting them from danger. Therefore, one may infer that attachment



exists when there occurs a stable propensity over time to seek proximity and contact with specific figures (Ainsworth, 1972).

Support for the biological function of attachment is found in the continuity of conditions which will predictably heighten attachment. That is, an infant promotes and maintains proximity of an attachment figure during those times in which he is most vulnerable to danger, or when danger is imminent. Behaviors that promote proximity and/or contact with a specific figure have been predictably activated when an alarming event occurs in the environment (Bronson, 1971; Maccoby & Jacklin, 1973; Rosenthal, 1967); when the infant is fatigued (Anderson, 1972; Brooks & Lewis, 1973a); immediately following short-term separations from mother in naturalistic settings (Bowlby, 1953; Bowlby, Ainsworth, Boston & Rosenbluth, 1965; Fagan, 1966; Moore, 1969; Provence & Coleman, 1957; Schaffer & Collender, 1959); immediately following brief separation from mother in a laboratory situation (Ainsworth, 1964; Ainsworth & Bell, 1970; Ainsworth & Wittig, 1969; Baraga, 1975; Belkin & Routh, 1975; Feldman & Ingham, 1975; Maccoby & Feldman, 1972; Willemssen, Flaherty, Heaton & Ritchey, 1974); and when the infant encounters a stranger (Ainsworth, 1964; Ainsworth & Bell, 1970; Ainsworth & Wittig, 1969; Beckwith, 1972; Belkin & Routh, 1975; Maccoby & Feldman, 1972). Primate studies have yielded comparable findings. Infant monkeys, after incurring short-term separations from their mothers, will exhibit more clinging and proximity promoting behaviors upon reunion than during pre-separation (Hinde & Spencer-Booth, 1970; 1971; Kaufman & Rosenblum, 1967). Although attachment behaviors can be activated and terminated by external and internal factors, attachment itself is considered enduring. Other



theorists agree that there may well be an inherited disposition to form an affectional bond to one's primary caretaker and furthermore that this early development may be a crucial factor in other areas of development (Cairns, 1966, 1972; Harlow, 1961; Sears, 1972).

The cluster of behaviors which indicate attachment has been determined by criteria which emphasize a differential response to a specific person. These have included proximity promoting behaviors such as touching, gaining proximity/contact, vocalizing to and looking at mother as well as exploration from mother as a secure base, crying when held or comforted by another person, and crying when mother departs (Ainsworth, 1964; Ainsworth & Wittig, 1969). Furthermore, Ainsworth (1972) has stated that attachment is more than the behaviors which define it. It is to be considered a propensity or even a structure in the Piagetian sense of the word which is responsible for the distinctive quality of the organization of the specific attachment behaviors through which a given individual promotes proximity with a specific attachment figure. Therefore, although intercorrelations among the behaviors which constitute attachment reveal only limited stability and consistency (Coates, Anderson & Hartrup, 1972a, 1972b; Maccoby & Feldman, 1972) there does seem to be a commonality of certain behavioral patterns in particular situations among varying age groups to justify the use of the unitary concept of attachment (Ainsworth & Bell, 1970; Ainsworth, Bell & Stayton, 1972; Baraga, 1975; Belkin & Routh, 1975; Coates et al., 1972a; Maccoby & Feldman, 1972; Masters & Wellman, 1974).

The interrelationship among attachment behaviors and their stability over time increases when one distinguishes which behavior



is being elicited (Coates et al., 1972a, 1972b). It has been argued that the group of attachment behaviors initially proposed by Ainsworth (1964) should be divided into two classes: those which are restricted to physical interaction such as clinging, touching and remaining near, and those behaviors which occur across a distance such as vocalizing, looking and smiling (Ban & Lewis, 1974; Lamb, 1976; Lewis & Ban, 1971; Lewis & Weinraub, 1974; Lewis, Weinraub & Ban, 1972). Lewis and his colleagues prefer to speak of this distinction as a further subdivision of attachment behavior, the former being labelled proximal and the latter being labelled distal attachment. Lamb (1976), however, suggests that since these behaviors differ on conceptual as well as empirical grounds, proximal and distal attachment behaviors should be reclassified attachment and affiliative behaviors, respectively.

Regardless of how they are labelled, a stable pattern of differences appears when attachment behavior is subclassified as such. Proximal attachment behaviors show more long and short term stability with 10, 14 and 18 month infants (Coates et al., 1972b), one and two-year olds (Lewis & Ban, 1971), and two, two and a half and three year olds (Maccoby & Feldman, 1972) than do distal attachment behaviors. Proximal attachment behaviors of touching and remaining near mother have been found to be positively and significantly related to one another (Coates et al., 1972a; Lewis & Ban, 1971; Maccoby & Feldman, 1972). Observing the two types of attachment behaviors over time within a single session, proximal behaviors increase while distal behaviors remain stable (Brooks & Lewis, 1973a). Sex differences, when they have been found, have indicated that girls exhibit more proximal



forms of attachment to mothers than do boys (Ban & Lewis, 1974; Brooks & Lewis, 1973b; Bronson, 1971; Goldberg & Lewis, 1969; Messer & Lewis, 1972). Two of these studies (Brooks & Lewis, 1973b; Goldberg & Lewis, 1969) also found that girls vocalize more to mother as well.

Baraga (1975), in a condition where mother was busy, reclassified traditional attachment behaviors into distal and proximal attention-seeking. She found that infants classified according to attachment type, that is, secure and non-secure types, exhibited different preferences for type of attention-seeking. The securely-attached infants utilized both types equally as often while proximal bidding was preferred by the insecurely-attached group and distal by the attached group. Moreover, there were significant correlations found between type of attention-seeking and exploration. Proximal attention-seeking was negatively correlated to all exploration measures while the distal type had significant positive relationships. These results seem to indicate that two classes of behaviors may be manifestations of different behavioral systems. That is, it appears that proximal attachment behaviors may be exclusively in the service of attachment while distal attachment behaviors, although at times functioning as attachment, may also serve other functions such as engaging mother in play or procuring her aid.

Lamb (1976) labels distal attachment behaviors as affiliative behaviors since they occur to other friendly persons as well as to mother. It has been found, in fact, that there is a significant increase in affiliative behavior to strangers between the ages of two and three. Moreover, two forms of distal bids (looking and smiling) were more strongly and consistently related in interaction with a stranger than



with mother (Maccoby & Feldman, 1972). Although several studies have indicated that there are no differential attachment behaviors elicited between mother and father under one-parent present conditions (Feldman & Ingham, 1975; Kotelchuck, 1972; Ross, Kagan, Zelazo & Kotelchuck, 1975; Spelke, Zelazo, Kagan & Kotelchuck, 1973; Willemssen et al., 1974), in a non-stress one-parent situation it has been found that eight and twelve month infants direct more proximal behaviors to mother than to father (Lewis & Weinraub, 1974; Lewis et al., 1972). Theoretically, the primary attachment develops normally to mother (Bowlby, 1958, 1969); therefore, the infant would be expected to respond differentially to her. However, in times of stress, proximity-seeking behaviors generalize to other adults (Rosenthal, 1967) and thus, under these conditions they would also be expected to generalize to father. In a stressful situation with both parents present, one-year olds have been shown to exhibit more proximal attachment behaviors to mother (Lamb, 1976). Interestingly, in this same condition, both with and without stress, a significantly greater number of distal attachment behaviors were exhibited to father. Thus, any discussion or further research of attachment should distinguish between its proximal and distal behavioral indices and delineate their relationship to other behavioral systems.

The attachment classification scheme devised by Ainsworth and associates (Ainsworth, Bell & Stayton, 1971, 1972) appears to be an initial attempt to relate empirically attachment to other areas of development. By categorizing mother-infant pairs into secure and non-secure types, based not on the presence or absence of attachment, but according to its quality, it becomes possible to look at attachment in



relationship to other variables. To do so, the infant is first seen in the "strange situation," a laboratory method standardized by Ainsworth and Wittig (1969) specifically to heighten attachment behaviors. The infant-mother interactions, especially those which occurred during reunion episodes following brief separations, are then rated on scales which include proximity- and contact-gaining, maintaining, resisting, and avoiding. The resultant scores are further analyzed to produce the classifications of securely-attached, insecurely-attached or detached. In building this system, it was observed that mothers of these three infant groups differed in ratings of "degree of sensitivity" (Ainsworth et al., 1971). Thus, the groups are defined as follows: to the extent that the mother has been sensitively responsive to the infant's communications, the securely-attached baby will use his mother as a secure base from which to explore. However, the infant will still respond to stress with heightened attachment behavior and during these times proximity-seeking will interfere with exploration. To the extent that mother-infant interaction has been disturbed by the mother's rejection, the infant becomes detached; that is, he will respond to stress with defensive proximity-avoiding behavior. This infant might spend most of his time in exploration and will tend to seek out his mother in this context less than the other two infant groups. An infant becomes insecurely-attached to the extent that mother-infant interaction had been made disharmonious through the mother's psychological neglect. These infants react with great distress in the separation episodes and with ambivalence to their mothers in reunion episodes. Also, attachment behaviors remain heightened after separations, thus distorting the attachment-exploration balance.



Utilizing this categorization procedure, relationships have been found between attachment types and other developmental variables. Bell (1970) observed that the development of object concept was intimately associated with quality of attachment. Those babies with normal attachment quality were significantly more advanced in the development of person permanence at the ages of 8½, 11 and 13½ months than their non-normal counterparts. The latter group was observed to possess negative or no decalage which in turn seemed to interfere in normal development of person permanence. She concluded that the quality of attachment is highly influential during the formative period of affective and cognitive structures.

In a follow-up study of these same infants at 20½ months, a fifteen point difference was found in the developmental quotient derived from the Bayley Scales of Infant Development favoring securely-attached infants over non-securely-attached types (Main, 1973). Differences in exploration were also noted. In one hour of free play, the securely-attached group played more intensely, in longer bouts, with more positive affect, and they paid more attention to the detailed aspects of a toy than did the other two groups. The former group was also more cooperative, indicating a higher level acquisition of social skills. The insecurely-attached group was more avoiding of peers and displayed more anger. Overall, there was no strong significant difference between the groups in cognitive development as defined by symbolic play and language use. This study appears to be the first major effort in relating the quality of mother-infant relationship to subsequent development in other areas. A more recent study utilizing a different sample than the previously cited works also indicated differences in amount of exploration



according to attachment types (Baraga, 1975). The detached group (following Ainsworth's classification) consistently exhibited more exploratory behaviors than the securely-attached group, who in turn explored more than the insecurely-attached group.

Mahler and her associates (1975) have also discussed the importance of attachment to exploration. As has been supported elsewhere (Schaffer & Emerson, 1964; Ainsworth, 1973), these authors concur that attachment occurs at approximately the same time as locomotion. Therefore, the child begins to physically as well as psychologically distance himself from mother. However, they concur that mother still continue to be needed as a stable point to fulfill the need of emotional refueling through physical contact. Mahler also noted differences in the child's preferred use of proximal or distal interactional behaviors but states that it is closely connected with the preferred modality of the mother.

Furthermore, parallel to Ainsworth's delineation of three attachment types according to their behavior in the strange situation, Mahler describes similar individual differences in their laboratory playroom. According to the latter author, these differences can be accounted for, in part, by mother's reaction to the infant's separation of himself from her. For example, anecdotal evidence was offered describing a mother who so rejected the child's separating himself that the child would "altogether lose contact with his mother when he was at a distance from her." This is reminiscent of Ainsworth's "detached" child. A counterpart of the "insecurely-attached" child was one whose mother had been unable during symbiosis to provide maximal availability. Thus, when most children were investing energy in exploration, she, unsure of distal maternal closeness, would sit at her mother's feet, imploring and beseeching her



mother with her eyes. The normal interaction observed at this age, like Ainsworth's "securely-attached" group, consisted of the infant taking great pleasure in exploring away from mother yet "refueling" with mother contact, either proximally or distally, at regular intervals.

Most of the work done with attachment behaviors, as first outlined by Bowlby (1969), has been with one-year olds. Maccoby and Feldman (1972) noted that with their three-year old sample, distal attachment behaviors were preferred and that there was little crying when the child was separated from his mother. Thus, it may be assumed that with age the child has a greater tolerance for being alone or being separated from mother. Mahler, who also observed this developmental trend, explains it with the concept of individuation. According to the separation-individuation theory, by 30 to 36 months of age, establishment of mental representations of the self as distinctly separate from representations of the object has paved the way to self-identity. "The internal mother, the inner image or intrapsychic representation of the mother . . . should become more or less available in order to supply comfort to the child in mother's physical absence" (1975, p. 118). Furthermore, it is deduced that the basis for the stability and quality of this inner representation is the result of mother-child interactions during the first emergence of the child's separateness.

In summary, then, the theoretical and empirical work on attachment has been extremely fruitful in delineating the clusters of behaviors defining attachment, the situations in which these behaviors are elicited, individual differences in attachment, and relationships



between attachment and other developmental areas. Mahler, who has independently discussed this formation of a specific child-mother bond, gave further implications to the source of these qualitative individual differences. Given that there exists reliable experimental methodologies for both differentiation and attachment, it would now be valuable to developmentally evaluate the relationship of these two constructs in young children.

#### Individuation: Competence

Individuation is considered as separate but intertwined with separation (Mahler et al., 1975). Individuation consists of those achievements marking the assumption of the child's own individual characteristics. It is the evolution of intrapsychic autonomy, perception, memory, cognition and reality testing. Internal regulatory mechanisms develop and gradually solidify, enabling the child to cope with his individual problems (Mahler & McDevitt, 1968). This emerging ability to cope, which has both emotional and physical concomitants, has summarily been discussed elsewhere as competence.

White (1956) used the term competence to define the exercise of behaviors which lead to a feeling of efficacy and thus to a source of gratification that is universally and spontaneously sought by all members of our species. Hendrick (1951) has also described a "pleasure in mastery" and this has even been observed in infants (Appelton et al., 1975). Bronson (1974), in discussing the development of competence and personality in young children, states that "under the right circumstances, a sense of competence becomes part of the image that the individual has of himself and which leads him to expect that under most conditions he

is likely to encounter, he will be able to cope with whatever demands he meets, and to derive joy from the encounter" (p. 243). Yet in all children and, indeed, in all adults, this "sense of competence" does not exist. Murphy and Moriarty (1976) based their longitudinal study (from infancy to adolescence) around the issues of vulnerability and coping, attempting to ferret out infancy predictor variables of pre-adult coping skills. They discovered that an important infant variable in later coping abilities was capacity to delay. In explanation, the baby's quiet delay of action permits him to absorb, differentiate, compare and even to organize his perceptions. Furthermore, they state that differentiation of surroundings (ability to shift attention and assimilate impressions) interacts with the tendency to form strong attachments. These early developments, both perceptual and emotional, contribute something to the later ability to cope.

Researching mother variables, these authors report that mother's respect for her child's autonomy correlated positively with this infant tendency to delay action until orientation has been completed. Deducting from other research on maternal variables (Ainsworth et al., 1971; Mahler et al., 1975), this variable would also have an effect on development of a secure attachment. Moreover, Escalona and Heider (1959) found that capacity to delay at 12-32 weeks related to high IQ children or with those children whose IQs improved while growing up. Therefore, an early sense of competency may be related to both perceptual-cognitive variables and mother-child reaction. The idea of greater differentiation, used here both in regard to the object world and to mother, also seems implicated in its development.



Some authors have indicated that by the age of three the basic abilities for competent functioning are laid and can be predictive of later functioning (Bronson, 1974; White, 1972). Interestingly, a factor analytic study of three and four-year olds who were assessed on dimensions of seemingly competent functioning; self-control, approach-avoidance tendency, self-reliance, subjective mood and peer affiliation produced three main groups. One of these groups was described as both socialized and independent, another was labelled disphoric and disaffiliated but functioning at a higher cognitive level than the other groups, while the third group was insecure, and had little self-control or self-reliance (Baumrind, 1967; Baumrind & Black, 1967). These groups also differed in parenting styles. Parents of the first group scored high on variables of nurturance, control and making demands. The parenting style of the second group was less nurturant than the other groups but more controlling. The third group's parents were found to be non-demanding and used withdrawal of love as a control technique.

Baumrind's three groups are very reminiscent of Ainsworth, Bell and Stayton's (1971, 1972) three quality of attachment groups. In addition, applying Mahler's theoretical scheme of psychological birth (1975), Ainsworth's groups are predictive of those outlined by Baumrind. For example, Mahler's scheme includes the assumptions that (1) the early mother-child relationship is the groundwork for future interpersonal relationships; (2) independence or autonomy is indicative of successful separation from her; and (3) development of competency is intricately involved in the quality of the child's separation and individuation.



Therefore, Ainsworth's securely-attached group would be predictive of Baumrind's socialized and independent group. The hallmark of the securely-attached infant is that he is able to mix exploration with attachment behaviors to mother. Thus, with the beginnings of successful separation-individuation this child would have, by the age of three, internalized his representation of mother and would be able to function independently of her. Early exploration of his environment would have provided gratification and, in turn, would have motivated further mastery strivings. These strivings would be, however, evenly balanced with interpersonal interaction, as they were earlier.

The detached group of Ainsworth's scheme would be predictive of Baumrind's disaffiliated but high cognitive achievement group. The detached infant was described as one who had given up hope of a successful relationship with mother and had turned his energy to the external environment. By one year of age he had probably successfully differentiated and separated himself from mother, perhaps earlier than the normal group, but did not use mother as a secure base. Therefore, mastery of the environment would predictably become his main source of gratification at the expense of interpersonal interactions.

Finally, Ainsworth's insecurely-attached group would be predictive of Baumrind's third group characterized by insecurity with little self-reliance or self-control. The insecurely-attached infant maintained closeness to mother at the expense of exploration. Therefore, this infant would predictably not have gained a sense of mastery and competence of his environment and would be continually seeking help and attention. Moreover, his interpersonal relationships would probably be characterized by



emotional dependency to mother at the expense of achieving a sense of mastery and competence, and could thus be indicative of Baumrind's third group. This group is characterized by insecurity and little self-control or self-reliance.

In summary, "sense of competency" implies a positive developmental accomplishment necessary for further healthy growth. Since it emerges relatively late in the ongoing process of growth and maturation, it is naturally affected and possibly predicted from the earlier developmental accomplishments of differentiation and attachment. Likening development of competency to Mahler's concept of individuation, it may be thought of as a process independent of, yet interrelated to separation. Autonomy, achievement strivings and independent functioning appear to be related both to psychological differentiation and to attachment. Therefore, it would be of value to look further into the complex interrelationships of these three developments--differentiation, attachment and competency--in the first three years of life.

#### Statement of the Problem and Specific Hypotheses

Differentiation, the intrapsychic separation from mother, begins during the symbiotic state, when mother and child are one (Mahler et al., 1975). It has been hypothesized that mother-child interaction during this state and mother's reaction to the child's natural emergence from that state determine how the child will later relate to her and use her for emotional refueling when attempting to gain mastery over his environment.

Differentiation as a process, however, does not stop with the formation of initial body boundaries. The higher the level of

differentiation, the clearer are the separations of what belongs to the self and what is identified as external to the self. Greater segregation of the self makes possible greater determination of functioning from within, as opposed to a reliance on external nurturance and support of maintenance. Therefore, mother-child interactions and the subsequent formation of mother-child attachment is both influenced by and is influential in the development of differentiation. Furthermore, differentiation has definite implications (as does attachment) for the development of independent and competent functioning.

The present longitudinal study is an initial attempt to theoretically and empirically relate three heretofore independent developmental concepts--differentiation, attachment and competence. Measures of these concepts will be (1) the Preschool Embedded Figures Test as a measure of field-dependence (Coates, 1972); (2) codings of child behavior utilizing Ainsworth and Wittig's (as modified by Baraga, 1975) method of strange-situation to measure attachment behaviors at age one and three; and (3) the Minnesota Child Developmental Scale (Ireton & Thwing, 1974) as a measure of cognitive, perceptual/motor and social development as well as self-help skills. In addition, a measure of maternal personality variables, the Edwards Personal Preference Scale (Edwards, 1959), was utilized.

It was hypothesized that infant attachment behavior at age one and maternal personality variables would be predictive of attachment behavior, competency skills and degree of psychological differentiation at age three. Furthermore, these three latter variables were expected to be significantly interrelated.



The direction and pattern of the relationships between these variables was also predicted. This was done by utilizing the theoretical scheme proposed to explain the possible intertwined development of differentiation, attachment and competency.

Table 1 illustrates the maternal characteristics which are proposed to be associated with detached and insecurely-attached children. It further purports the degree of psychological differentiation and level of competency functioning expected to be associated with these two mother-infant types.

TABLE 1

PREDICTED INTERRELATIONSHIPS BETWEEN MATERNAL PERSONALITY  
VARIABLES, PSYCHOLOGICAL DIFFERENTIATION, ATTACHMENT,  
AND COMPETENCY

Maternal Variable	Differentiation	Attachment	Competency
rejective	high	detached	advanced development
ambivalent	low	insecure	developmen- tal lag

Therefore, it was expected that maternal variables which predict child-rejecting behavior would be positively related to (1) degree of psychological differentiation, (2) strange-situation behaviors indicative of a detached mother-child relationship (for example, maintaining distance from mother, little separation distress, high independent exploration), and (3) competency skills. Maternal variables which predict ambivalent child-interactions were expected to relate

negatively to (1) degree of psychological differentiation and (2) competency skills, and positively to strange-situations behaviors indicative of an insecure mother-child relationship (for example, maintaining proximity to mother, separation distress and low independent exploration).



## CHAPTER III

### METHODS

This longitudinal study covers a two-year span. Mother-infant pairs were observed in a laboratory situation for approximately one hour each, once in April, 1974, and again in May, 1976. Also, a number of paper and pencil tests were administered at these times.

#### Subjects

Subjects consisted of 36 mother and infant pairs who were initially observed when they were between the ages of 11 and 14 months (Baraga, 1975). There were 19 female and 17 male infants included in the original sample. Criteria for selecting subjects were infant chronological age, sex, ability to walk, and mother's willingness to transport her infant to the setting within a specified two-week period. The names of possible subjects were acquired from the Grand Forks, North Dakota, newspaper which reported all births in the community. Letters were sent to over 200 parents, who were subsequently phoned with the request that they participate in the study. Of approximately 100 of those parents who expressed a willingness to participate, 40 infants were chosen. Due to illness or inability to keep their scheduled appointments, four of the subjects were eliminated from the first observation. Twenty of the original sample, 8 females and 12 males, comprised the group of subjects for the second observation. This was

conducted 25 months after the initial testing. Reduction of the sample was the result of 10 families having moved from the area and 6 families finding it inconvenient to participate.

### Experimental Setting

Two different laboratory playrooms located in the same building were utilized for Time I and Time II. A 9' by 20' room served as the setting for Time I observations (Figure 1). Two doors opened into the room. A chair was placed next to each door, one designated "mother chair" and the other "stranger chair." The room was chalked off into eight  $4\frac{1}{2}'$  by 5' squares and labelled with alphabetical letters for the observers' benefit. Initially, a number of age-appropriate toys, such as stuffed animals, dolls and educational toys that were designed to facilitate infant manipulation, were scattered in Blocks A, B, C and D. There was also a six-foot air-filled clown in the far corner of E square. At the beginning of the last episode, a novel toy which was a small toddler trike, was placed in Block B by the experimenter to reinterest the child in exploration.

The Time II playroom was larger, giving the three-year-old more space in which to distance himself from mother. This setting was approximately  $23\frac{1}{2}'$  by  $7\frac{1}{2}'$ , but it was not perfectly rectangular (Figure 2). Like the first setting, two doors opened into the room and a "mother chair" and "stranger chair" were placed near a door. The room was marked off into four areas labelled M, A, B and S. Areas M and S were of equal size and each contained an adult chair and a child-sized desk and chair.

A file cabinet was located in Areas A and B, containing age-appropriate toys (puzzles, dolls, a tea set, building blocks, record



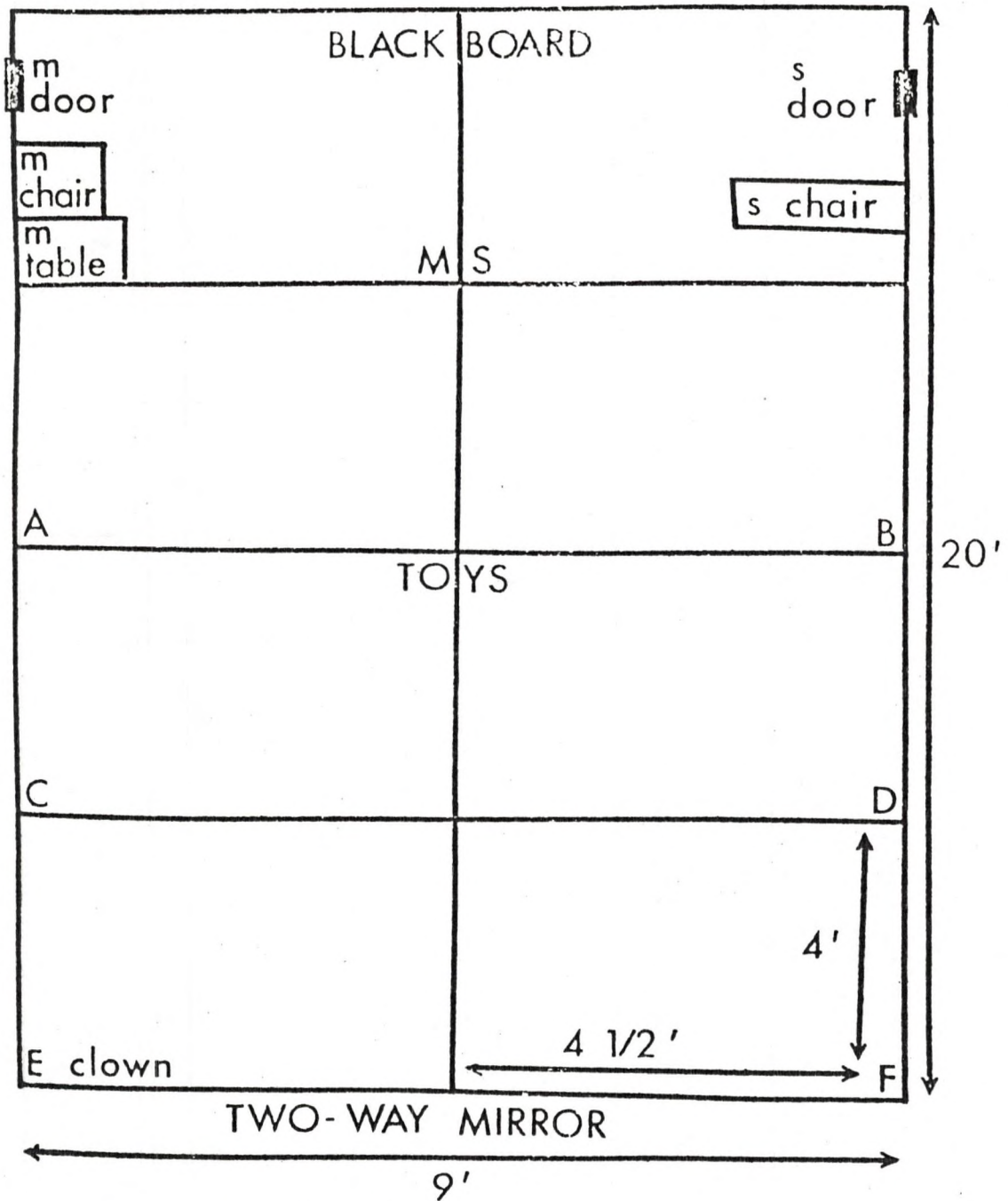


Fig. 1. Experimental Setting: Time I.

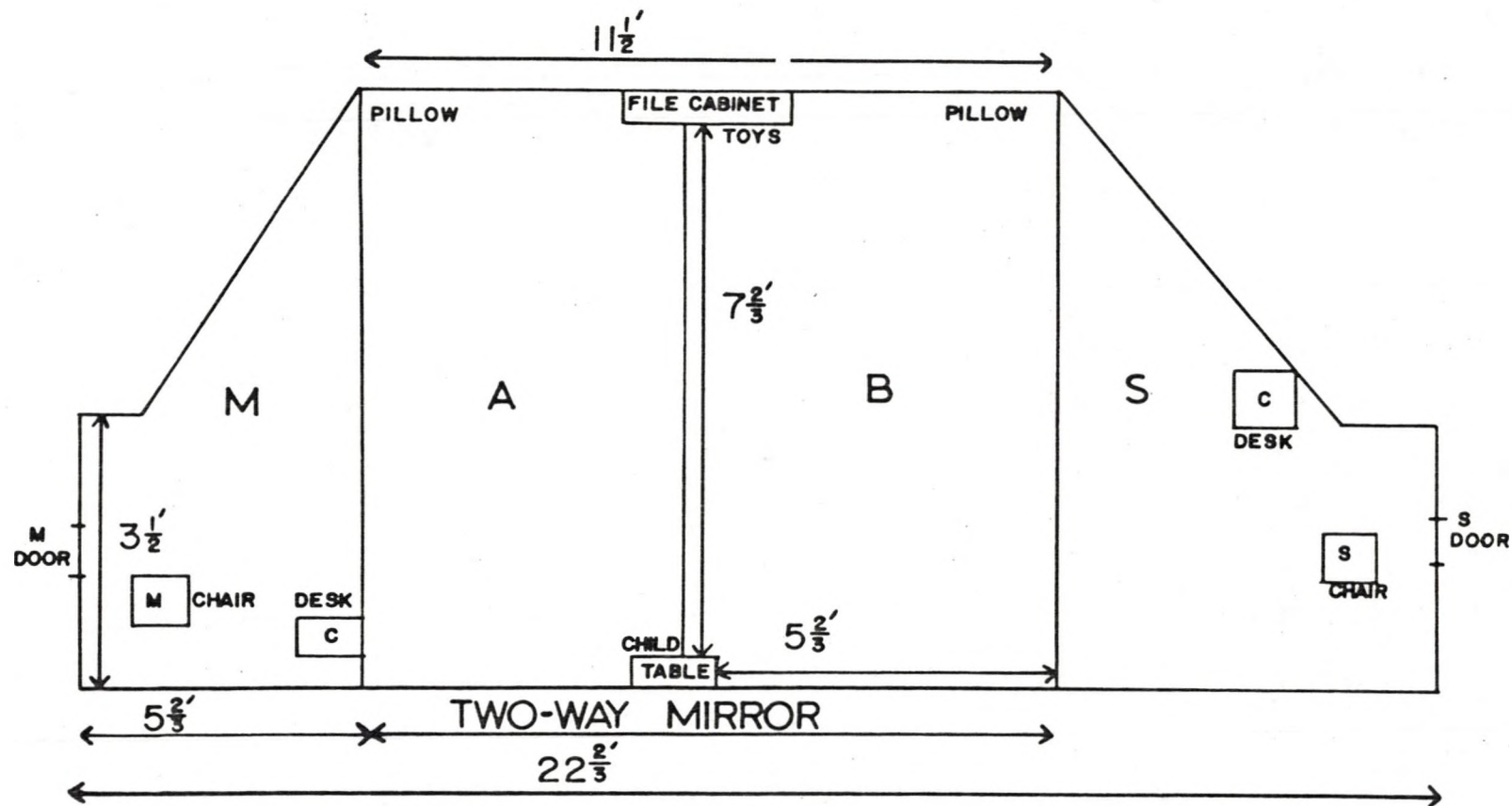


Fig. 2. Experimental Setting: Time II.



player.) The cabinet stood opposite a children's table upon which stood a Fisher-Price Sesame Street set. In addition, a large pillow was placed in the corner of both Areas A and B.

Both laboratory playrooms were equipped with a two-way vision mirror, allowing adequate space through which to observe. The observation rooms were also equipped with sound from the playrooms.

#### Observational Methods

For both observations, upper-class undergraduate students majoring in psychology acted as observers. They worked in shifts of two, each putting in an equal amount of time. Research credit was earned by them for their participation. For the first observation, the observers were trained beforehand in the techniques of objective narrative recording. The second group of observers were trained to code behaviors in vivo. During two pilot sessions each observer recorded the behaviors as if it were the experimental trial. An abbreviation code was devised and they were trained to record this information using as few words as possible.

The first group of observers narrated behaviors with the use of reel-to-reel tape recorders. When all the mother-infant pairs had been observed, two independent workers, one of whom was the experimenter, transcribed each tape and blocked them into 15-second intervals with the use of a stop-watch. The transcriptions were then consolidated into one comprehensive narrative from which behavioral ratings were procured.

Behavioral measures of the second observation were compiled in vivo. Trained observers independently coded the presence, absence and type of certain prescribed behaviors (a sample code sheet is contained in Appendix A). Again, a time-sampling technique was utilized. Every



15 seconds, when signalled by an automatically programmed sound, the observers checked the appropriately designated categories if the behaviors of focus had occurred.

#### Procedure

The initial phase of the experimental procedure was identical for both Time I and Time II. That is, each mother-infant pair was given a scheduled appointment. Upon arrival, mother was presented with written instructions (Appendix B and C) concerning her role in the strange situation. These instructions were then discussed with the mother. After the experimenter was sure the instructions were understood, the mother and her child participated in the procedures outlined in Tables 2 and 3. Any questions concerning the nature of the experiment were deferred until the episodes were completed.

The playroom procedure followed in Time I was a slight modification of the strange situation devised by Ainsworth and Wittig (1969). One episode had been omitted and another added to facilitate the specific purposes of the original observation (Table 2). Altogether there were seven coded episodes which were subsequently combined to form five experimental conditions (Table 4). The first two episodes formed the pre-separation condition. While both episodes three and five involved mother separations, they remained differentiated into stranger condition and alone condition. Since both episodes four and six followed mother separations, they were combined to form the reunion condition. Finally, the last episode involved the number present but busy, forming the mother-occupied condition.



TABLE 2

## STRANGE SITUATION EPISODES: TIME I

Episode Number	Duration	Participants	Description of Episode
Orientation	3 minutes	Observer, mother, baby	Observer ushers mother and baby into the room, then leaves. M uses this time to familiarize B with the room in any way she chooses.
1	3 minutes	Mother, baby	M sits down on a predesignated chair and remains there throughout the episode. B is free to explore.
2	3 minutes	Stranger, mother, baby	S enters, sits quietly for a moment, then talks with M. S approaches B gradually with a toy and M leaves.
3	3 minutes <sup>a</sup>	Stranger, baby	S tries to interest B in a toy if B is distressed. S responds to any initiations of interactions with B.
4	2 minutes	Mother, baby	S leaves as M enters. M pauses at door until B has mobilized a response. M comforts B if distressed and then tries to interest him in toys.
5	3 minutes <sup>a</sup>	Baby	M says "bye-bye" to B and leaves him alone for the duration of the episode.
6	3 minutes	Mother, baby	Same as episode 5.
7	9 minutes	Observer, baby, mother	Observer enters with a test booklet, explains the directions to M. O also brings a novel toy (toddler trike) which he sets in square B. M and B are then left alone, with M instructed to work on the test. She is seated at her previously designated chair.

<sup>a</sup>Episode was curtailed if the baby became too distressed.

TABLE 3

## STRANGE SITUATION EPISODES: TIME II

Episode	Duration	Participants	Description of Episode
1	3 minutes	Observer, mother child	M and C are accompanied into room by O, who immediately leaves. M has been instructed to be seated and remain seated while C is free to explore.
2	6 minutes	Stranger, child	S enters through S-door, introduces herself to M and C and is seated. M tells C she must go but will return soon. M departs through M-door.
3	3 minutes	Mother, child	M enters through M-door, S departs through S-door. M comforts C if distressed and then is seated in M-chair throughout episode.
4 <sup>a</sup>	6 minutes	Child	At a predesignated signal, M tells C that she must go, but will return soon. M departs through M-door.
5	3 minutes	Mother, child	M reenters through M-door, comforts C if distressed, and is reseated in M-chair throughout episode.
6	6 minutes	Observer, mother child	O enters with a test booklet, and explains the directions to M. M and C are then left alone, with M instructed to work on the test. She is seated in M-chair.

<sup>a</sup>Episode is curtailed if the child became too distressed.



TABLE 4

COMPARISON OF EXPERIMENTAL CONDITIONS: TIME I AND TIME II

Experimental Condition	Episode Number		Duration in minutes	
	Time I	Time II	Time I	Time II
Pre-separation	1,2	1	6	6
Stranger	3 <sup>a</sup>	2	3	6
Alone	5 <sup>a</sup>	4 <sup>a</sup>	3	6
Reunion	4,6	3,5	5	6
Mother-occupied	7	6	9	6

<sup>a</sup>Episode was curtailed if the child became too distressed.

In Time II, the subjects were again observed under the same experimental conditions although the exact procedure was slightly modified. Due to both the increased attentional capacities of the subjects being observed in their ability to be separated from mother for longer periods of time, the individual episodes were increased in duration. Thus, in Time II six episodes formed the five experimental conditions of six minutes each (Table 3). Only the reunion condition was a combination of two separate episodes.

Following the completed Time II playroom procedure, mother was escorted into an adjoining room where she was still visible to her child. Here she completed her questionnaire while a female graduate student with clinical training in child assessment administered a test to her child. If the child greatly protested mother's departure, she was allowed to remain silently seated behind the child.

### Measures: Time I

Behavioral ratings obtained from the first observation have been described in detail in Baraga (1975). Briefly, codings of the narrative recordings resulted in frequencies of locomotor, manipulatory and visual exploration in all conditions. In conditions where an adult was present, frequencies of vocalizing to, orienting to, maintaining proximity to and touching the adult were obtained in both the stranger and alone conditions. Finally, in the mother-occupied condition, frequencies of proximal and distal attention-seeking were obtained.

Attachment type also resulted from the first observations. The narrative record yielded scaled measures based on detailed codings of interactional behaviors (Ainsworth et al., 1971). There were six such classes of behaviors: Proximity- and contact-seeking, contact-maintaining, proximity- and interaction-avoiding, contact- and interaction-resisting, distance interaction and search behavior. After the coding and scaling of the protocol was completed, each infant was classed into one of three categories: securely-attached, detached or insecurely attached. One judge classified all 36 infants while a second independent judge classified a random sample of 16%. Inter-judge agreement was 100%. This classification scheme resulted in 7 detached, 22 securely-attached and 7 insecurely-attached infants. Of the 20 Time II subjects who returned, this classification system had yielded 3 detached, 13 securely-attached and 4 insecurely-attached infants.

### Maternal Personality Variables

Each mother completed the Edwards Personality Preference Scale (EPPS). This instrument provides measures on fifteen separate personality



variables associated with manifest needs. The needs provide some implications for child rearing. The fifteen variables with associated characteristics are as follows:

- Achievement: to do one's best, to be successful
- Deference: to get suggestions from others, to praise others
- Order: to keep things neat and orderly, to have meals organized with a definite time for eating
- Exhibition: to say witty and clever things, to be the center of attention
- Autonomy: to be able to come and go as desired, to avoid responsibility and obligations
- Affiliation: to do things with friends rather than alone, to form strong attachments
- Intracception: to observe others, to understand how others feel about problems
- Succorance: to have others provide help when in trouble, to receive a great deal of affection from others
- Dominance: to persuade and influence others to do what one wants, to supervise and direct the actions of others
- Abasement: to feel guilty when one does something wrong, to feel depressed by inability to handle situations
- Nurturance: to treat others with tenderness and sympathy, to show a great deal of affection towards others
- Change: to experiment and try new things, to experience novelty and change in daily routine
- Endurance: to keep at a job until it is finished, to put in long hours of work without distraction
- Heterosexuality: to go out with members of the opposite sex, to be in love with someone of the opposite sex
- Aggression: to become angry, to blame others when things go wrong

#### Measures: Time II

Behavioral ratings were also obtained during the second observation. For all five experimental conditions in Time II, play behavior was recorded. A distinction was made as to whether it was manipulatory play (reaching for, picking up or manipulating objects in the environment including banging, pushing, pulling) or fantasy play (use of objects in the environment as participants in a pretend world of the child). A further distinction was made as to whether manipulatory and fantasy play occurred alone or included another person.



In addition, in conditions where an adult was present, the behaviors of looking at, vocalizing to, maintaining proximity to and touching the adults were recorded. Interactional bids made to the adult were tallied. These were defined as any behavior of the child which was an attempt to elicit a behavior from mother or stranger. Thus, they were differentiated according to two supposed purposes of the child--a bid for emotional comfort and/or support or a bid for help. Emotional-support bids included child behaviors which demanded mother to pay attention to the child without necessitating any further interaction. This category also included behaviors which were elicited to gain mother's nurturance, either vocally or physically. For example, whining to be held was coded as an emotional-support bid. Alternatively, help-seeking bids included those behaviors which attempted to elicit mother's direct instrumental aid or which requested some information from her. These two types of bids, emotional-support and help-seeking, were further coded as to location of child relative to mother. Therefore, if child was in mother's area when he elicited the aid, it was recorded as proximal. If the child was anywhere else, it required distal coding.

In the two separation conditions, stranger and alone, behaviors of crying (ranging from whining to actual tearing) and searching for mother (looking at or touching the door and calling to mother) were recorded.

Finally, an activity level of the child was obtained. This was done by simply noting the child's location every fifteen seconds and subsequently tallying the number of executed square changes.



To arrive at a statistical summary, a score of one was given for each of the behaviors in each fifteen second time interval in which they occurred. The maximum score for a behavior for each condition was 24, since the standard length of the condition was six minutes. If an episode was terminated due to child crying, the scores were prorated. Frequency measures of designated behaviors were obtained for each of the five experimental conditions.

Interrater reliability for two independent coders in five randomly selected cases were as follows: manipulatory play, .88; fantasy play, .86; solitary play, .88; interactional play, .89; activity level, .92; proximity to adult, .96; touching adult, .99; vocalizing to adult, .94; looking at adult, .85; proximal bids, .95; distal bids, .97; emotional-support bids, .89; help-seeking bids, .92; crying, .99; searching for mother, .96.

**Paper and Pencil Tests.** Each mother completed the Minnesota Child Development Scale (MCDI). This is a 320-item yes-no inventory concerned with the presence or absence of certain age-graded behaviors. This instrument has been standardized on 1 to 6-year olds from a neighboring state and thus seemed valid for the present subject population. The scale provides a current level of development on eight scales:

- General development: which provides an overall index of development;
- Gross-motor: which measures locomotion, strength, balance and coordination;
- Fine-motor: which measures visual-motor skills;
- Expressive language: which measures expressive communication;
- Comprehension-conceptual: which measures language comprehension;
- Situation comprehension: which measures non-verbal understanding of and interaction with the environment;
- Self-help: which measures self-help skills;
- Personal-social: which measures initiative, independence and social interaction.

In addition, the Preschool Embedded Figures Test (PEFT) was individually administered to each child. This test consists of 24 complex black-and-white pictures in which is embedded a simple equilateral triangle. It is a downward extension of the Children's Embedded Figures Test and thus provides a measure of field-dependence, independence in preschool age children.

#### Data Handling and Analyses

1. Principle-component orthogonal factor analysis was utilized with both Time I and Time II behavioral variables. This effectively (a) reduced the data, (b) detected patterning of variables in the experimental conditions and (c) provided individual scores on the resultant factors which were used in later analysis.

2. The predictive potential of maternal personality characteristics for child's attachment behavior (as measured by individual scores on factors) was calculated using multiple linear regression analysis. The former variables were also correlated to developmental levels at age 3.

3. Multiple linear regression analysis was used to examine the relationship of a number of independent variables: attachment behaviors at age 1 and 3, maternal personality variables, and child developmental level, to the 3-year old's level of field dependence. Resulting from the small numbers in the three attachment groups, a test for significant differences between the groups was not attempted. However, difference in field-dependence between the two extreme attachments was statistically tested. Group means and standard deviations for all groups are presented.



## CHAPTER IV

### RESULTS

The results are presented in five major sections pertaining, respectively, to (1) Time I and II, strange-situation factor analyses, (2) relationship of factors to each other and to developmental level, (3) maternal personality prediction of strange-situation factors and relation to developmental level, (4) prediction of field-dependence, and (5) an overview of significant relationships.

#### Factor Analyses

Time I: Thirty-three variables (see Appendix D for means and standard deviations) were factor analyzed to produce eight factors (Table 5). These accounted for 79% of the total variance. All eigen values above 1.5 were included in the rotation (see Appendix E for enumeration of the variables loading  $>.40$  on the eight factors.)

The eight factors are briefly described as follows:

Factor one includes a large number of behaviors related to infant exploration in mother's absence. Crying when separated from her has a high negative loading on this factor, as does obtaining physical comfort when reuniting. It therefore seems to characterize a lack of disturbance when separated from mother.

Factor two includes many behaviors which occurred when mother was occupied. It appears to reflect an infant's willingness to let

TABLE 5

FACTORS RESULTING FROM ANALYSIS OF STRANGE-SITUATION BEHAVIORS:  
TIME I

Factor	Characteristic	Number of loadings >.40	Total percentage of variance accounted for
1	Non-disturbed functioning when separated from mother	5	17.5
2	Solitary play when mother is occupied	11	13.8
3	Non-disturbed functioning in presence of stranger	4	13.0
4	Active pursuit of mother's attention	7	9.0
5	Cautiousness, inactivity	7	8.4
6	Reunions with mother marked by ignoring and high exploration	7	7.0
7	High activity level	3	5.5
8	Shift from proximal to distal mother interactions before and after separation	4	4.9

mother be alone when she is busy while simultaneously engaging in solitary exploratory behaviors. Furthermore, these behaviors appear to relate to the infant's use of vocalization as the preferred interactional mode both with mother and stranger.

Factor three characterizes the infant's ability to engage in exploration while a stranger is present. This is further related to a high level activity far from mother in a free-play situation and is negatively related to searching for mother when separated.



Factor four, in contrast, reflects an active interest in finding mother when she is absent and persistent demands for attention when she is occupied. These behaviors are further related to high manipulatory exploration when mother's attention is available.

Factor five depicts an overall cautiousness or constricted activity on the part of the infant. This factor includes the behaviors of staying near mother along with the use of visual exploration to check things out in the new and strange situation. In her absence, mother is not searched for yet visual exploration of the environment remains high.

Factor six is characterized by a high interest in exploration following mother separations. This exploration during reunion appears to preclude efforts for physical comfort and closeness after a supposedly stressful event. This is further related to vocalizing to mother when she is busy and to not vocalizing when she is attending.

Factor seven includes behaviors which depict a motorically active infant. These behaviors are also related to checking out the stranger.

Factor eight includes two distinct types of behaviors. The first type indicates high proximal interaction with mother prior to separation; the second indicates distal interactions following separation. Therefore, this factor seems to describe a shift in preferred type of mother interactions following separation from her, i.e., from proximal to distal.

Time II: Fifty-eight variables (see Appendix F for means and standard deviations) were factor analyzed to produce seven factors which accounted for 78% of the total variance. All eigen values above 2.0 were included in the rotation. (See Appendix G for enumeration of the variables loading  $>.40$  on the seven factors.)

TABLE 6

FACTORS RESULTING FROM ANALYSIS OF STRANGE-SITUATION BEHAVIORS:  
TIME II

Factor	Characteristic	Number of loadings >.40	Total percentage of variance accounted for
1	Active involvement with adult in play behavior	19	24.7
2	Seeking of mother's attention when withheld/ distressed by separation	14	15.3
3	Other-directed behaviors, in response to stress, at the expense of solitary play	10	13.2
4	Non-interactional play which is disrupted during separation	7	8.9
5	Preference for fantasy play and emotional support-seeking to manipulatory play and help-seeking	7	6.9
6	Maintenance of distal interaction with mother, proximal interaction with stranger	9	5.2
7	High activity, manipulation and help-seeking; low fantasy and interaction play	6	3.8

The seven factors are briefly described as follows:

Factor one includes a large number of behaviors which can be characterized as social or affiliative. These are directed both to mother prior to separation and to stranger. Moreover, both manipulatory and fantasy play behaviors are included, especially in



interaction with adults. Therefore, this factor appears to reflect the child's high involvement with an available adult in play activity.

Factor two includes those behaviors utilized by the child to gain mother's attention when she is busy. Both types of emotional comfort and help as well as talking to, staying near and touching are reflected by this factor. Also included are proximal behaviors during the reunion episodes and solitary play in the presence of the stranger.

Factor three, like factor one, includes many other-directed behaviors. However, this factor appears to reflect affiliative behavior reactive to stress, since most of its behaviors occur during the reunion and mother-occupied episodes. Solitary play has a high negative loading on this factor.

Factor four primarily includes separation behaviors which are indicative of disturbed functioning. For example, crying, searching for mother and disruption of play all load highly on this factor. These behaviors further relate to the tendency to play alone, not interactionally, when mother is present.

Factor five best characterizes a preference for fantasy play at the expense of manipulatory play. This play preference seems positively related to the seeking of emotional support and negatively related to the seeking of help.

Factor six includes those mother-interaction seeking behaviors which occur at a distance from her. Proximity-maintaining behaviors load negatively on this factor. However, also included here are stranger-directed proximity-maintaining and comfort-seeking behaviors.

Factor seven includes manipulatory and active play behaviors which are related to the seeking of adult help. These behaviors relate negatively to fantasy and interactional play.

Individual subjects received scores on each of the Time I and Time II factors. These fifteen factor scores were used in the proceeding analyses in place of actual behavior frequencies.

#### Time I and Time II Factors

##### Relationship to Each Other

Multiple linear regression analyses were computed utilizing each Time II factor as the criterion variable. The results of the analyses are shown in Table 7. None of the multiple  $r$ 's reached significance

TABLE 7

MULTIPLE LINEAR CORRELATIONAL ANALYSES WITH TIME I FACTORS AS THE INDEPENDENT VARIABLES

Criterion variable	Percentage of variance accounted for	Multiple $r$	$F^a$
1. adult play involvement	51.6	.711	1.41
2. separation distress	56.8	.754	1.81
3. other-directed behavior	46.9	.685	1.21
4. solitary play	39.5	.628	0.90
5. fantasy play	40.1	.634	0.92
6. distal-mother interaction	43.2	.657	1.05
7. manipulatory play	48.2	.694	1.28

<sup>a</sup>df = 8, 11

(see Appendix H for Time I and II factor means and standard deviations and Appendix I for correlational matrices). Two Time I factors (cautiousness and inactivity, #5; high activity level, #7) were negatively correlated



at a significant level ( $p < .05$ ) to the Time II factor 2 (described as the seeking of mother's attention when it is withheld and becoming distressed by separation).

The only other significant relationship between these two sets of factors was between Time I, factor 8, and Time II, factor 6. Shifting from proximal mother-interactions to distal interactions proceeding separations at the age of one was significantly related ( $p < .05$ ) at age three to maintaining distal interactions with mother while preferring proximal interactions with stranger.

#### Relationship to Developmental Level

Multiple linear regression analyses were computed utilizing each subscale of the Minnesota Child Developmental Inventory (MCDI) as the criterion variable (see Appendix J for MCDI means and standard deviations). Time I and Time II factors served as predictor variables. The results of the analyses are shown in Table 8. None of the multiple correlations reached significance. Furthermore, there were only a few significant relationships found among the variables (see Appendix K and L for correlational matrices). Time I, factor 1 (non-disturbed play in the presence of a stranger) was significantly related ( $p < .05$ ) to language understanding (comprehension-conceptual scale) while maintaining distal interactions with mother and proximal interactions with stranger (Time II, factor 6) was significantly related to three MCDI scales. This later factor had a positive relationship ( $p < .01$ ) to general level of development, gross-motor skills and situation comprehension.

TABLE 8

PREDICTION OF DEVELOPMENTAL LEVELS (MINNESOTA CHILD DEVELOPMENTAL INVENTORY) FROM TIME I AND TIME II FACTOR SCORES

Scale Criterion	Percentage of variance accounted for	Multiple r	F
Time I <sup>a</sup>			
general-development	35.1	.593	.74
gross-motor	26.3	.513	.49
fine-motor	25.2	.502	.46
expressive language	43.0	.656	1.04
comprehension-conceptual	47.0	.687	1.23
situation-comprehension	27.2	.521	.51
self-help	46.3	.680	1.18
personal-social	22.2	.471	.39
Time II <sup>b</sup>			
general-development	40.3	.635	1.16
gross-motor	46.2	.680	1.47
fine-motor	37.3	.611	1.02
expressive language	32.8	.572	.84
comprehension-conceptual	36.0	.600	.96
situation-comprehension	61.5	.784	2.74
self-help	23.4	.483	.52
personal-social	41.3	.642	1.21

<sup>a</sup>df = 8, 11

<sup>b</sup>df = 7, 12

#### Maternal Personality as a Predictor

##### Strange Situation Factors

Further multiple linear regression analyses were computed using the Edwards Personal Preference Scale (EPPS) variables (see Appendix M for means and standard deviations) as the independent variable. Results of the analyses predicting Time I and Time II strange-situation factors



are shown in Table 9. None of the multiple correlations reached significance.

TABLE 9

PREDICTION OF TIME I AND TIME II STRANGE-SITUATION FACTORS FROM MATERNAL PERSONALITY VARIABLES (EDWARDS PERSONAL PREFERENCE SCALE)

Factor	Percentage of variance accounted for	Multiple r	F
Time I <sup>a</sup>			
1	91.3	.955	2.78
2	62.9	.793	.45
3	68.4	.827	.58
4	84.5	.919	1.46
5	91.3	.956	2.80
6	81.6	.903	1.18
7	80.0	.895	1.07
8	87.6	.936	1.89
Time II <sup>b</sup>			
1	76.3	.874	.86
2	85.3	.924	1.55
3	74.8	.865	.79
4	83.9	.916	1.39
5	71.5	.846	.67
6	59.2	.769	.75
7	73.8	.859	.80

<sup>a</sup>df = 15, 4

<sup>b</sup>df = 15, 4

Examination of the correlation matrices (Appendix N and O) revealed an interesting pattern of significant relationships between EPPS variables and the strange-situation factors. As indicated in Tables 10 and 11, maternal deference, dominance, abasement and

TABLE 10

SIGNIFICANT PRODUCT MOMENT CORRELATION BETWEEN MOTHER PERSONALITY  
MEASURES (EDWARDS PERSONAL PREFERENCE SCALE) AND CHILD STRANGE-  
SITUATION FACTOR SCORES: TIME I

Factor	EPPS Scale	$r^a$
1. Nondisturbed functioning when separated from mother	order succorance	.547 .710
2. Solitary play when mother is occupied	deference dominance abasement	-.444 .495 -.530
5. Cautiousness, inactivity	deference autonomy heterosexuality aggression	.556 .404 .383 .382
6. Reunions marked by ignoring/ high exploration	heterosexuality	-.514
7. High activity level	autonomy dominance endurance abasement	-.496 .617 -.406 -.416
8. Shift from proximal to distal mother-interaction	dominance abasement	.432 -.444

<sup>a</sup> $r = .378$ ,  $p < .05$ ;  $r = .561$ ,  $p < .01$ ;  $df = 15, 4$



TABLE 11

SIGNIFICANT PRODUCT MOMENT CORRELATIONS BETWEEN MATERNAL PERSONALITY MEASURES (EPPS) AND CHILD STRANGE-SITUATION FACTOR SCORES (TIME II)

Factor: Time II	EPPS Scale	$r^a$
1. Active adult involvement in play	achievement	.459
2. Seeking mother's attention/separation distress	aggression	-.548
	autonomy	.420
	endurance	.503
3. Other-directed behaviors when in stress	achievement	.448
4. Solitary play disrupted by separation	autonomy	-.446
	intraception	.581
5. Fantasy play and emotional-support seeking	achievement	.469
6. Maintains distal mother-interaction/proximal stranger-interaction	achievement	-.462
7. Manipulatory play and help-seeking	achievement	.463

<sup>a</sup> $r=.378$ ,  $p < .05$ ;  $r=.561$ ,  $p < .01$ ;  $df = 18, 4$

heterosexuality each have significant relationships to Time I factors, yet are not related significantly to Time II factors. Furthermore, maternal achievement is significantly related to five of the seven Time II factors but not to any Time I factors. Only the personality variable of autonomy had more than one significant correlation to each of the Time I and Time II factors.

Finally, those maternal characteristics which were most related to strange-situation factors (number of significant relationships 3)

were achievement, autonomy, dominance and abasement. Interestingly, dominance and abasement had complementary relationships to identical factors.

Three variables (exhibition, nurturance and change) had no significant relationship to the factors and were omitted from Tables 10 and 11. Also omitted were Time I factors 3 and 4, as neither were related significantly to any EPPS scale.

#### Developmental Level

Measures of EPPS and MCDI were intercorrelated (see Appendix P for correlational matrix). Table 12 shows the relationships of significance. It can be seen that maternal dominance, affiliation and nurturance are the most highly related variables to developmental levels. Achievement, order, succorance, change, endurance, heterosexuality and aggression were not significantly related to the individual MCDI scores and thus were omitted from Table 12. For similar reasons, the personal-social scale was omitted.

As would be expected, general level of development has the highest number of significant relationships to maternal personality variables.

#### Prediction of Field-Dependence

Field-dependence, as measured by the Preschool Embedded Figures Test (PEFT) was used as the criterion variable in a number of multiple linear regression analyses ( $X=6.15$ ,  $S.D.=4.78$ ). Independent variables were Time I factors, Time II factors, the MCDI and the EPPS. Results of these analyses are shown in Table 13. None of the multiple correlations were significant.



TABLE 12

SIGNIFICANT PRODUCT MOMENT CORRELATIONS BETWEEN MATERNAL PERSONALITY MEASURES (EPPS) AND CHILD'S LEVEL OF COMPETENCY (MCDI)

MCDI Scales	EPPS Scales	$r^a$
general development	deference	-.392
	affiliation	-.447
	intraception	.456
	dominance	.460
	nurturance	-.407
gross-motor	affiliation	-.575
fine-motor	affiliation	-.473
	dominance	.417
	nurturance	-.472
expressive language	dominance	.496
	abasement	-.423
comprehension-conceptual	dominance	.447
situation comprehension	exhibition	.380
	autonomy	-.387
personal-social	nurturance	-.378

<sup>a</sup> $r = .378$ ,  $p < .05$ ;  $r = .561$ ,  $p < .01$ ;  $df = 18$

TABLE 13

FOUR SETS OF INDEPENDENT VARIABLES USED TO PREDICT THREE-YEAR OLDS PRESCHOOL EMBEDDED FIGURES TEST PERFORMANCE

Independent variables	Percentage of vari- accounted for	Mr	d.f.	F
Minnesota Child Development Inventory	36.7	.606	8, 11	.78
One-year old Strange-Situation Factor Scores	46.3	.680	8, 11	1.85
Three-year old Strange-Situation Factor Scores	22.0	.469	7, 12	.484
Mothers' Edwards Personal Preference Scale Measures	82.3	.907	15, 4	1.243

There were three significant relationships of individual variables to PEFT (see Appendix Q for correlations between PEFT and Time I and II factors, MCDI, and EPPS). Maternal autonomy was positively related ( $p < .01$ ) to field-dependence. Moreover, PEFT was negatively related to two 3-year old variables: gross-motor development ( $p < .05$ ) and the maintenance of distal interactions with mother, factor 6 ( $p < .05$ ).

#### Attachment Type

Means and standard deviations are presented for each attachment-type group in Table 14. As predicted, the insecure group scored the lowest on the PEFT, the detached group the highest, and the secure group fell between these extremes. The difference between the two extreme groups' PEFT scores was statistically significant ( $t=2.83$ ,  $df=5$ ,  $p < .02$ ).

TABLE 14

MEANS AND STANDARD DEVIATIONS OF THE PRESCHOOL EMBEDDED FIGURES  
TEST FOR THREE ATTACHMENT-TYPE GROUPS

Group	N	Mean	Standard Deviation
Insecure	4	3.25	1.5
Secure	13	6.62	5.4
Detached	3	8.00	2.6

#### Overview of Significant Relationships

All of the obtained significant interrelationships were examined. Field-dependence had one significant correlation to a competency skill, gross-motor development. Surprisingly, this was negative. Moreover, field-dependence was also negatively related to what had been assumed a detachment factor--maintaining distance from mother. This latter



factor, on the other hand, was positively related to three competency skills--general development, gross-motor and situation-comprehension.

Field-dependency, as expected, was related to a maternal variable predictive of rejection--autonomy. Autonomy was defined as being able to come and go as desired and being avoiding of responsibility. One would expect a mother high on this to have little time for her child's bids for attention. However, maternal autonomy was not associated with detached behaviors as expected, but rather was negatively associated both to independent functioning (solitary play, maintaining maternal distance) and positively related to insecure behavior (seeking mother's attention and exhibiting separation distress). It was also negatively associated, at age one, to cautiousness and high activity. Moreover, autonomy had a negative correlation to a competency skill--situation comprehension.

The two maternal variables most positively associated to competency skills (general development, fine-motor, expressive-language and conceptual comprehension)--were also related to independent play at both one and three years of age. These were dominance (supervising and directing) and intraception (observing and understanding). Those maternal variables which were most negatively correlated to competency skills (general development, fine-motor, gross-motor and personal-social skills) had no further association to either child behavior or field-dependence. These were affiliation (the forming of strong attachments) and nurturance (being tender, caring and sympathetic).

Maternal abasement (the instilling of guilt) was both negatively correlated to a competency skill (expressive language) and to one-year

old behaviors--solitary play, high activity, and shifting to distal interactions.

Maternal achievement which was most positively related to the three-year old's interactional behavior had no further relationships to either competency skills or field-dependence.

In summary, therefore, the predicted patterns were only partially supported. Field-dependence did not have the positive relationships to competency and detached behaviors as expected; rather, when they were found they were negative. Field-dependence was, as predicted, related to maternal rejection. This latter variable, however, had further negative associations to both detached behaviors and competency skills. Moreover, autonomy was positively related to insecure attachment at age three.

Factors representative of independent functioning were positively related to competency development while dependent functioning (or the lack of independent play) was negatively related to competency. Maternal variables most associated with advanced competency were dominance and intraception. The most negatively associated variables to these skills were nurturance and affiliation.



## CHAPTER V

### DISCUSSION

The focus of the present study was upon the development of field-dependence, and how the child's social interaction with the mother influences this aspect of cognitive and perceptual function. The results suggested that a separation of the sample of children according to attachment type at age one was predictive of differences in field-dependence at age three. The most field-dependent children were the insecurely attached, while the detached children showed evidence of more field-dependent perception. In terms of Ainsworth's theory the detached children have accommodated themselves to less attention from the mother. This decreased emphasis on mother interaction and resultant increase in exploration of the inanimate environment (Baraga, 1975) appears to be conducive to a field-independent cognitive style. The child whose interaction pattern with the mother is characterized by insecure attachment, on the other hand, seems to be continually attempting to reaffirm the relationship with the mother, with less interest in exploring the environment. The finding that the child's interaction pattern at age one is consistent with scores on a measure of perceptual function at age three provides support for the notion that cognitive development and social development are reciprocal and interdependent processes. While these basic relationships seemed to hold in accordance with the theory reviewed above, many of the social interaction measures did not

show significant relationships to field-dependence. Before addressing the paradoxical relationship of field-dependence to indices of maturational progression, it seems important to consider some of the methodological issues which may have contributed to the lack of significant findings with many of the interactional measures.

Strange-situation behaviors obtained at age one and three were factor analyzed to account for 80% of the variance. This produced eight and seven factors, respectively. Factor scores were then used to represent strange-situation behaviors in multiple linear correlational analysis.

None of the computed multiple correlations reached significance. Included were predictive relationships where the independent variables were strange-situation factors (age one) and maternal personality traits, the criterion variables being strange-situation factors (age three), competency skills and field-dependence. Also computed were multiple correlations between strange-situation factors (age three) and both competency development and field-dependence, as well as a multiple correlation between the latter two variables.

A methodological explanation for the lack of statistically significant multiple linear correlations is readily apparent. The power of the statistic was limited from the outset. The high number of independent variables used with a small subject sample limited the degrees of freedom available for each multiple correlation. Also, it is likely when using this statistical tool that as one increases the number of independent variables, the correlations between them increase. This in turn increases the standard errors of partial coefficients which



effectively serves to reduce the test's power (Cohen & Cohen, 1975).

Due to the exploratory nature of the study and the variables utilized, exclusion of some of these variables did not seem justified. Furthermore, there is no a priori reason to not include certain variables. Of course, with the high number of both independent and dependent variables and thus the increased number of hypotheses which were being tested, an additional risk was taken. Spurious significance may have occurred. Since this did not happen, it appears that in this study, the former risk was the greatest.

Since many simple correlations reached significance, the effect of adding a number of independent variables may have been to suppress these variables. However, again there is a large risk taken when examining individual correlations that obtained significance is spurious. Given the number of correlational matrices, a large number of significant relationships is expected by chance. However, since many of these obtained were internally consistent, attention to them is deserved before the significant results are dismissed as chance. More evidence, of course, is needed to give credence to the present tentative results.

#### Behavior Over Time

Since the strange-situation has been used repeatedly in researching attachment, and since it yields an unwieldy amount of data, factor analysis used here did three things. It (1) reduced the data, (2) delineated behaviors which were most interrelated, and (3) provided a means to test relationships of these factors to each other and to other important developmental variables.



Surprisingly, three Time I factors had no significant relationships to any other experimental variables. These factors were exploring in stranger's presence, the active pursuit of mother's attention, and reunions marked by ignoring. Escalona and Heider (1959) also noted in their longitudinal study that the least predictable behaviors from eight months to preschool were response to unfamiliar situations and response to strangers. It seems likely, therefore, that these responses are ever-changing in the first years of life and so dependent on such a large number of factors that single observations of them are not productive. In fact, questions are raised as to the usefulness of stranger involvement and attending to separation anxiety, at least at age one.

Two of the Time I factors which were correlated with other variables represented activity. Escalona and Heider (1959) further observed that "predictions concerning the manner in which a child was expected to use space seemed most strongly related to everything else that had been predicted about the child" (p. 93). Three of the predictors used by these authors were activity level, capacity to remain motorically inactive and the gross versus fine developmental pattern of motor development. Murphy and Moriarity (1976) also found that capacity to delay movement was a good predictor of independence in preschool. Therefore, these two factors, confirming other longitudinal studies, appear to have relevance to later behavior.

Specifically, in this study, both cautiousness and high activity level had negative relationships to the three-year old's seeking of mother's attention and becoming distressed when separated. Since separation distress is a normal infant behavior (Ainsworth, 1972; Bowlby,



1958, 1969) which children tend to outgrow by age three (Maccoby & Feldman, 1972; Mahler et al., 1975), it could be considered as immature when emitted at this age. Thus, both cautiousness (or the ability to delay action) and high activity seem to disconfirm later immaturity. Also, since activity is related to maternal dominance which is further related to competency development, further evidence (albeit tentative) is given to it being predictive of more mature functioning. Both activity and cautiousness have negative associations to autonomy, which is further related to field-independence. Thus field-independence here aligns itself with more immature functioning.

Neither non-disturbed functioning when mother was alone nor solitary play at age one were related to similar age three factors. Therefore, the child that plays alone at one is not necessarily the independent three-year old. It is unclear why this is so. Perhaps one-year old independence is more a mark of maturity than of becoming a "loner." That is, solitary play at one may simply be indicative of a child who already experienced a period of separation distress and has learned to understand and accept time-limited separations as non-threatening. This hallmark of development would not necessarily predict further independence from mother but perhaps indicates a step to use mother differently. Also, of course, some of the children who were independent at age one may have regressed to more immature forms of behavior.

Finally, the eighth Time I factor which resulted from the data may have accounted for an infant's in vivo coping strategy adaptation in response to brief separations. Many of the mothers in the study

were full-time caretakers and rarely, if ever, left their infants alone in a strange situation prior to the study. Therefore, some of the infants were confronted with this situation for the first time. While in the actual experiment, they may have learned to cope with or accept it by shifting from proximal to distal maternal interaction. It could also be, of course, that this shift was simply a function of time.

After the initial use of mother for security in an unknown situation, the child learned that it was safe and felt free to depart from mother.

At any rate, the child who made this shift at age one was likely to maintain distal interactions with mother at age three. This latter behavior has been thought of as a "detached" behavior but perhaps rethinking is indicated here. Detachment implies the lack of any relationship, independence to the point of ignoring. Distal interactions, however, are not ignoring mother but rather interacting over space. Moreover, it could imply that the child feels safe enough with mother's whereabouts that he is able to increase the distance between them yet still maintain contact. This ability has been considered part of a maturing relationship with mother (Maccoby & Feldman, 1972; Mahler et al., 1975). Since maintaining distance from mother has further relationships to advanced competency development, this maturational interpretation is supported. At any rate, whether this distal mode of interacting with mother is due to a detached or secure relationship, it is related to advanced development.

Only three of the Time II factors appeared to have much relevance to other variables in the study--seeking mother's attention/separation distress, solitary play, and maintaining maternal-distal-interactions. The latter variable has been looked at extensively by other attachment



researchers (Lamb, 1976; Lewis, 1971). The other four factors had relationships to maternal achievement but to no other variables. It could be that maternal achievement is most highly predictive of a child who will perform in front of others, a reflection of good parenting.

In summary, from the factor analyses, it appears that for both ages one and three, ability to play alone and to maintain maternal-distal-interactions has important implications to other areas of development. At age one, cautiousness and activity level are important but seeking mother's attention is not. This latter variable, however, gains importance at age three. A possible explanation for this is since most children do not show separation stress at three, it then becomes a discriminating variable.

#### A Re-examination of Field-Dependency

As predicted, insecure and detached infants, as labelled at age one, obtained the expected difference in field-dependence, the detached group being more field-independent. However, none of the behavioral factors supported these results. In fact, both age one and three strange-situation factors supported contradictory results. That is independent functioning and maintaining distance from mother were consistently associated with field dependence. On the other hand, insecure attachment behaviors (seeking mother's attention and exhibiting separation distress) were associated with field independence. In addition, detached behaviors are related positively to competency development, while insecure behaviors are negatively correlated.

It is possible, therefore, that these two extreme attachment groups, as outlined at age one, do not exhibit the same behaviors at

age three. Mahler et al. (1975) in fact discuss at length an explanatory concept for this phenomenon, the "rapprochement crisis." At the height of the child's mastery, it dawns on the child that he is a relatively small and separate individual and he then begins to resist and undo actual separateness from mother. Therefore, the detached child in Ainsworth's scheme who had become independent of mother too early due to greater differentiation, would have probably experienced this crisis more painfully. Thus, he may have regressed to more immature forms of mother-interactions.

Furthermore, Mahler contends that quiet availability of mother is necessary for the child to identify with her and thus give her up. However,

. . . the less emotionally available the mother is at the time of rapprochement, the more insistently and even desperately does the toddler attempt to woo her . . . this process drains so much of the child's developmental energy that, as a result, not enough . . . is left for the evolution of the many ascending functions of the ego (p. 80).

This concept of rapprochement offers a valuable explanation for the present findings. The detached child at age one is highly differentiated from mother. As he further differentiates and understands his separateness, he becomes frightened so that he retreats from his environment. He instead seeks mother's attention and becomes distressed when she leaves. The results of the present study support this pattern of behavior, which is associated with maternal rejection, and thus unavailability. Finally, as further supported by this study, the child's energy is tied up in becoming reunited with mother and thus competency development lags.



The insecure child, on the other hand, has his initial anxiety when he first becomes aware of his separateness. He then retreats and psychological differentiation, or separateness from mother, never becomes clearly defined. As he develops cognitively and motorically, he can put more distance between mother and himself and explore his environment. Since his separation has not fully taken place he is not awed by his own vulnerability. So, availability for more environmental interaction leads to greater competency skill development, but psychological differentiation remains low.

Winnicott's early paper on the capacity to be alone (1958) supports and expands Mahler's theory. It offers a further theoretical framework in which to conceptualize the negative association between field-dependence and independent functioning in the presence of mother. Winnecot proposed that when mother is preoccupied and identified with her infant, the child exists in a protective environment. Within this environment, ego immaturity can be balanced by her ego support. "The infant is able to become unintegrated, to flounder, to be in a state in which there is no orientation" (p. 34). In the course of time, the individual is able to forego the actual presence of mother due to the establishment of an "internal environment." He becomes emotionally mature and integrated.

Therefore, the three-year old who is able to play independently in the presence of mother is "ego-related" to her. He remains relatively undifferentiated, relying on her for ego-support. Yet he is able to explore the environment independently and this interaction contributes to the more mature competency skills. Furthermore, the

dominant mother who has been associated with greater competency skills fits with the description of the mother who is over-identified and pre-occupied with her child. The intrceptive mother, who has also been associated with independent play and a greater level of development, is more representative of Mahler's "quietly available" mother (1975). With this extra time and space within which to be undifferentiated, the infant may therefore develop gradually, allowing more integration along the way.

Winnicott goes on to say that the child who did not exist in a protective environment and did not have a sense of mother's ego-support would have to build an ego structure immaturely as he began to sense his separateness and his own vulnerability. He would not feel free to become unintegrated or flounder but rather would need to remain in a relatively integrated and differentiated state. This sense would naturally be frightening, and the child, not having confident expectations for ego-support, would spend his energy gaining proximal support. It is unlikely that this early differentiation would lead to more mature forms of integration.

The types of possible developmental progressions that have been outlined above involve either early maturing or regression to more immature functioning. Field-independence, unexpectedly in this study, is associated with more immature development. However, this finding supports Waber's (1976) hypothesis that early maturers are more field-dependent than their counterparts. She argues that since perceptual field-dependence is strongly correlated with spatial abilities, a constellation of biological factors, including genetic, endocrinological,



and neurological components figure in this perceptual development. Waber (1976) has supported her thesis utilizing an adolescent sample.

Other authors have also investigated the neurological components of field-dependence. Although the EFT and RFT are primarily visospatial tasks as Waber contends, and thus involve right hemispheric functioning, the left hemisphere has also been shown to be involved in these tasks (Pizzamiglio & Cecchini, 1971; Teuber & Weinstein, 1956; and Russo & Vignolo, 1967). An explanation of left hemispheric involvement provided by Tucker (1975) states that the EFT task necessitates breaking down the original percept into alternative components parts. This could be termed perceptual analysis. Since EBT performance is also impaired by right hemispheric functioning (Pizzamiglio & Carli, 1974), it can be thought of as involving synthetic processing as well as analytic. Electroencephalographic analysis has shown both hemispheres to be desynchronized during EFT performance (Tucker, 1975). Furthermore, it was found that in normal college students, field-dependence was associated with minimal brain dysfunction (Neuringer, Goldstein & Gallaher, 1975). This research suggests that the EBT and RFT may be sensitive instruments in measuring brain function.

It has been further proposed that field-independence reflects greater lateralization of function between the hemispheres rather than simple dominance of one hemisphere over another (Pizzamiglio & Zoccolotti, 1977; Waber, in press). Tucker (1977) proposed that not only does field-independence reflect the degree of differentiation of perceptual and conceptual functions between hemispheres, it may also reflect integration. This hypothesis was supported by the higher

incidence of non-lateral eye movement (hypothesized as engaging both hemispheres simultaneously) in field-independent college students. In fact, a correlation between non-lateral eye movements and field-dependence in subjects of the present study was .49 ( $p < .05$ ). Although these data are complex, they may suggest that the social interaction patterns which result in different forms of attachment type have implications not only for perceptual functions, but also for the lateral specialization of the cerebral hemispheres.

Within this maturational theory one is left wondering about the influence of mother-child interaction on hemispheric organization of function. That maternal personality characteristics are implicated is supported by this study. The relationship between autonomous mothers and field-independent children, however, may have simply been a round-about way of showing again that field-independent mothers have like children (Goldstein et al., 1973), given the consistent relationship between autonomy and field-independence (Witkin et al., 1962; Alexander & Gudeman, 1965; Crutchfield, Woodward & Albrecht, 1958). However, the least competent or developed children were associated with very positive maternal characteristics, nurturance and affiliation. These maternal variables have been consistently likened to healthier, more emotionally secure children (Ainsworth, Bell & Stayton, 1972; Caldwell & Hersker, 1964; David & Appel, 1961; Moss, Ryder & Robson, 1967). Perhaps, then, these children will eventually become the most field-independent.

The explanation of hemispheric functioning proposed by Waber (in press) and Tucker (1977) are not totally at odds with Mahler et al.



(1975) and Winnicott (1958). In fact, Mahler et al. (1975) often refer to the biologically advanced child, noting that he has a more difficult time with emotional and psychological maturation. The relationship between hemispheric differentiation, field dependence, mother-child relationship and behavior is a complex one, indeed, and this study offers only very tentative information as to how they may be related.

APPENDIX A

SAMPLE CODE SHEET



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APPENDIX B

INSTRUCTIONS TO MOTHERS: TIME I

## INSTRUCTIONS TO MOTHERS: TIME I

This will consist of a series of episodes that are timed, so it is important that we follow these directions without interruption. Initially you will be taken into the main room with your baby and will be left there for awhile so that you both can become accustomed to the room. In the first episode a young woman will enter, talk with you for awhile, and give you a cue to leave the room. After a few minutes, you will re-enter, pause at the doorway so your baby sees you, and then get him/her interested in the toys again. Shortly afterwards you'll be called out of the room again. At this point, if the baby is making too much of a fuss, you can return. Otherwise, you'll remain outside and the baby will be alone for a few minutes. Then you will re-enter, and that essentially will be the end of the session. At that time a questionnaire will be brought into the room for you to fill out. The questionnaire should not last much more than 30 minutes.

Many thanks for your cooperation.



APPENDIX C

INSTRUCTIONS TO MOTHERS: TIME II

## INSTRUCTIONS TO MOTHERS: TIME II

Again, we will be participating in a series of timed episodes where your child is with and without you. When you are in the room with your child DO NOT initiate any interactions. If your child initiates interactions with you, respond as you normally would but do not leave the chair or continue in interaction with him/her, unless they persist.

To begin, you will be ushered into the laboratory room and seated. Here you will remain until there is a knock on the door behind you. A stranger will join you after 6 minutes. Remain seated until you hear the knock. Then get up and tell your child you must go out and will be back shortly. Close the door behind you.

The rest of the instructions will be given as we go along.

Each time you are instructed to leave, wait for the knock, tell your child you must go but that you will be back shortly.

Thanks for your cooperation.



APPENDIX D

MEANS AND STANDARD DEVIATIONS FOR TIME I BEHAVIORAL VARIABLES

TABLE 15

MEANS AND STANDARD DEVIATIONS FOR TIME I BEHAVIORAL VARIABLES

Condition	Variable	Mean	Standard Deviation
Pre-separation	Proximity to M	19.40	6.82
	Touching M	.85	1.14
	Vocalizing to M	5.90	3.43
	Looking at M	9.55	3.27
	Manipulatory exploration	13.10	4.64
	Visual exploration	19.00	3.50
	Locomotor exploration	6.10	3.90
Stranger	Vocalizing to S	3.90	3.86
	Looking at S	12.50	4.34
	Manipulatory exploration	9.40	7.57
	Visual exploration	16.00	6.26
	Locomotor exploration	3.40	4.40
Reunion	Proximity to M	21.65	3.75
	Touching M	5.95	4.05
	Vocalizing to M	3.85	2.68
	Looking at M	10.15	4.59
	Manipulatory exploration	10.05	3.49
	Visual exploration	16.65	3.84
	Locomotor exploration	4.75	3.99
Alone	Manipulatory exploration	3.90	6.47
	Visual exploration	7.20	9.55
	Locomotor exploration	2.00	2.97
	Search for M	9.45	2.28
	Cry	23.40	13.19
Occupied	Proximity to M	32.95	4.66
	Touching M	3.80	5.77
	Vocalizing to M	6.80	5.02
	Looking at M	10.70	5.00
	Manipulatory exploration	17.25	8.01
	Visual exploration	26.95	5.38
	Locomotor exploration	8.20	4.75
	Proximal bids	4.40	3.82
	Distal bids	4.45	2.98



APPENDIX E

TIME I STRANGE-SITUATION FACTORS: VARIABLES LOADING  $\geq$  .40

TABLE 16

TIME I STRANGE-SITUATION FACTORS: VARIABLES LOADING  $\geq .40$ 

Factor	Condition	Variable	Loading
One	Alone	Visual exploration	.955
	Alone	Locomotor exploration	.954
	Alone	Manipulatory exploration	.867
	Reunion	Touching M	-.763
	Alone	Crying	-.719
Two	Occupied	Manipulatory exploration	.842
	Occupied	Proximal bids	-.833
	Occupied	Visual exploration	.727
	Occupied	Vocalizing to M	.663
	Stranger	Vocalizing to M	.534
	Reunion	Proximity to M	-.499
	Reunion	Vocalizing to M	.473
	Occupied	Locomotor exploration	.454
	Occupied	Proximity to M	-.446
	Occupied	Orienting to M	-.416
	Occupied	Touching M	-.408
Three	Pre-separation	Locomotor exploration	.844
	Stranger	Visual exploration	.661
	Stranger	Manipulatory exploration	.556
	Pre-separation	Touching M	-.639
	Stranger	Locomotor exploration	.514
	Stranger	Vocalizing to S	.495
	Alone	Searching for M	-.403
Four	Occupied	Distal bids	.876
	Occupied	Looking at M	.792
	Alone	Searching for M	.505
	Pre-separation	Manipulatory exploration	.461
Five	Pre-separation	Proximity to M	.803
	Pre-separation	Visual exploration	.743
	Occupied	Proximity to M	.709
	Stranger	Visual exploration	.426
	Pre-separation	Manipulative exploration	.414
	Reunion	Vocalizing to M	.407
	Alone	Search for M	-.400



TABLE 16--Continued

Factor	Condition	Variable	Loading
Six	Reunion	Manipulatory exploration	.709
	Pre-separation	Vocalizing to M	-.640
	Reunion	Locomotor exploration	.613
	Reunion	Visual exploration	.579
	Reunion	Proximity to M	-.469
	Occupied	Vocalizing to M	.459
	Pre-separation	Manipulatory exploration	.427
Seven	Stranger	Looking at S	.796
	Stranger	Locomotor exploration	.742
	Occupied	Locomotor exploration	.654
Eight	Pre-separation	Looking at M	-.724
	Pre-separation	Touching M	.684
	Reunion	Looking at M	.581
	Stranger	Manipulatory exploration	.560

APPENDIX F

MEANS AND STANDARD DEVIATIONS FOR TIME II

BEHAVIORAL VARIABLES



TABLE 17

MEANS AND STANDARD DEVIATIONS FOR TIME II BEHAVIORAL VARIABLES

Condition	Variable	Mean	Standard Deviation
Pre-separation	Proximity to M	12.60	17.29
	Touching M	1.05	2.56
	Vocalizing to M	17.05	9.45
	Look at M	12.05	10.29
	Fantasy play	4.15	3.47
	Manipulatory play	8.55	5.53
	Interaction play	5.30	8.09
	Solitary play	8.80	5.53
	Activity	8.55	17.42
	Proximal bids to M	7.55	8.28
	Distal bids to M	8.45	6.51
	Emotional-support-M	13.65	16.18
	Help-seeking-M	7.30	10.75
Stranger	Proximity to S	16.65	12.86
	Touch M	0.10	0.31
	Vocalize to S	5.50	7.74
	Look at S	10.90	17.20
	Fantasy play	10.25	11.15
	Manipulatory play	7.00	9.67
	Interaction play	4.85	10.00
	Solitary play	11.35	9.00
	Activity	4.60	11.47
	Proximal bids to S	5.70	7.24
	Distal bids to S	0.90	2.65
	Emotional-support-S	4.95	6.52
	Help-seeking-S	1.15	2.70
Reunion	Proximity to M	13.00	7.49
	Touch M	1.70	1.84
	Vocalize to M	15.00	4.15
	Look at M	9.90	3.63
	Fantasy play	5.20	5.01
	Manipulatory play	9.70	4.91
	Interaction play	5.20	5.02
	Solitary play	7.45	4.96
	Activity	2.90	1.77
	Proximal bids-M	9.50	5.79
	Distal bids-M	6.20	5.96
	Emotional-support-M	10.20	4.74
	Help-seeking-M	5.25	3.19

TABLE 17--Continued

Condition	Variable	Mean	Standard Deviation
Alone	Search for M	15.75	24.39
	Crying	8.45	13.26
	Fantasy play	5.70	6.11
	Manipulatory play	9.00	6.32
	Solitary play	15.10	6.96
	Activity	3.85	3.51
Occupied	Proximity to M	11.60	9.58
	Touch M	1.70	3.28
	Vocalize to M	10.75	6.92
	Look at M	7.50	4.81
	Fantasy play	6.55	6.25
	Manipulatory play	9.20	6.39
	Interaction play	2.55	3.47
	Solitary play	14.10	9.27
	Activity	3.50	2.82
	Proximal bids-M	6.45	6.27
	Distal bids-M	4.10	4.66
	Emotional-support-M	7.75	5.13
	Help-seeking-M	3.90	3.58



APPENDIX G

TIME II STRANGE-SITUATION FACTORS:

VARIABLES LOADING  $\geq$  .40

TABLE 18

TIME II STRANGE-SITUATION FACTORS: VARIABLES LOADING  $\geq$  .40

Factor	Condition	Variable	Loading
One	Pre-separation	Emotional support-M	.952
	Pre-separation	Help-seeking-M	.941
	Stranger	Activity	.941
	Stranger	Looking at S	.934
	Pre-separation	Activity	.939
	Pre-separation	Proximity to M	.897
	Pre-separation	Vocalizing to M	.888
	Stranger	Interactional play	.870
	Pre-separation	Looking at M	.857
	Stranger	Distal bids	.853
	Stranger	Manipulatory play	.815
	Pre-separation	Interactional play	.813
	Stranger	Fantasy play	.737
	Stranger	Touching S	.732
	Stranger	Proximity to S	.729
	Pre-separation	Proximal bids	.680
	Pre-separation	Fantasy play	.555
	Reunion	Emotional-support-M	.490
	Stranger	Emotional-support-S	.427
Two	Occupied	Vocalizing to M	.920
	Occupied	Emotional-support-M	.836
	Occupied	Proximal bids	.800
	Occupied	Looking at M	.773
	Occupied	Solitary play	-.736
	Occupied	Help-seeking-M	.727
	Occupied	Touching M	.657
	Reunion	Touching M	.635
	Pre-separation	Fantasy play	.588
	Occupied	Interactional play	.579
	Stranger	Solitary play	.496
	Occupied	Activity	.475
	Reunion	Proximity to M	.455
	Occupied	Proximity to M	.419
Three	Reunion	Vocalizing to M	.767
	Stranger	Proximal bids	.767
	Pre-separation	Solitary play	-.701
	Reunion	Help-seeking	.689
	Reunion	Solitary play	-.689
	Reunion	Interactional play	.682
	Stranger	Vocalizing to S	.672
	Stranger	Emotional-support-S	.567



TABLE 18--Continued

Factor	Condition	Variable	Loading
	Pre-separation	Manipulatory play	-.490
	Stranger	Help-seeking-S	.453
	Occupied	Interactional play	.429
Four	Alone	Crying	.880
	Alone	Solitary play	-.796
	Alone	Search for M	.767
	Alone	Manipulatory play	-.561
	Pre-separation	Solitary play	.446
	Stranger	Solitary play	-.418
	Reunion	Touching M	.430
Five	Reunion	Manipulatory play	-.809
	Reunion	Fantasy play	.640
	Alone	Fantasy play	.618
	Occupied	Looking at M	.554
	Reunion	Emotional-support	.520
	Reunion	Help-seeking	-.518
	Pre-separation	Manipulatory play	-.418
Six	Occupied	Distal bids-M	.802
	Reunion	Distal bids-M	.722
	Reunion	Proximity to M	-.718
	Reunion	Proximal bids-M	-.715
	Occupied	Proximity to M	-.707
	Stranger	Vocalizing to S	.645
	Stranger	Emotional-support	.574
	Pre-separation	Distal bids	.536
	Alone	Fantasy play	.458
Seven	Occupied	Fantasy play	-.798
	Alone	Activity	.689
	Occupied	Manipulatory play	.608
	Stranger	Help-seeking	.526
	Reunion	Activity	.525
	Occupied	Interactional play	-.409

APPENDIX H

MEANS AND STANDARD DEVIATIONS OF TIME I AND TIME II

FACTOR SCORES



TABLE 19

MEANS AND STANDARD DEVIATIONS OF TIME I AND TIME II FACTOR SCORES<sup>a</sup>

Factor Number	Time I		Time II	
	Mean	S.D.	Mean	S.D.
1	.55	1.36	.30	2.18
2	63.80	24.31	38.65	29.13
3	.05	.09	1.55	6.73
4	45.30	24.18	37.05	31.62
5	.05	.83	.55	2.31
6	29.85	24.60	47.05	26.62
7	-.10	.64	4.50	20.60
8	46.30	27.76		

<sup>a</sup>Decimal places were moved by multiplying by 100.

APPENDIX I

CORRELATIONAL MATRIX FOR TIME I BY TIME II FACTORS



TABLE 20  
CORRELATIONAL MATRIX FOR TIME I BY TIME II FACTORS

Time I	Time II						
	1	2	3	4	5	6	7
1	-.059	-.140	-.098	.338	-.085	.183	-.084
2	.144	-.206	.173	-.103	.101	.253	.184
3	-.011	.090	-.029	-.117	-.018	-.087	-.013
4	.022	.208	.034	.201	.018	-.083	.006
5	-.038	-.419 <sup>a</sup>	-.005	.083	.040	-.295	-.020
6	-.322	.076	-.150	.158	-.127	.237	-.128
7	.098	-.456 <sup>a</sup>	.013	.083	.039	.065	.032
8	-.296	-.073	-.340	-.298	-.366	.395 <sup>a</sup>	-.351

<sup>a</sup><sub>p</sub> < .05

APPENDIX J

MEANS AND STANDARD DEVIATIONS FOR THE MINNESOTA

CHILD DEVELOPMENT INVENTORY



TABLE 21

MEANS AND STANDARD DEVIATIONS FOR THE MINNESOTA CHILD  
DEVELOPMENT INVENTORY

Scale	Mean	S.D.
General development	105.45	5.98
Gross motor	30.70	1.34
Fine motor	34.55	3.27
Expressive language	51.75	2.65
Comprehension-conceptual	47.55	6.19
Situation comprehension	38.60	4.38
Self help	29.80	3.82
Personal-social	31.95	1.82

NOTE: N=20

APPENDIX K

CORRELATIONAL MATRIX BETWEEN STRANGE-SITUATION FACTORS

(TIME I) AND THE MINNESOTA CHILD DEVELOPMENT

INVENTORY (MCDI)



TABLE 22

CORRELATIONAL MATRIX BETWEEN STRANGE SITUATION FACTORS (TIME I)  
AND THE MINNESOTA CHILD DEVELOPMENT INVENTORY (MCDI)<sup>a</sup>

Time I Factors	MCDI Subscales							
	GED	GEM	FIM	ELA	COC	SIC	SEH	PES
1	-.209	-.230	-.327	.076	.108	.011	-.049	-.141
2	.086	.224	.183	.012	-.217	.169	-.138	.032
3	.093	-.196	.158	.320	.318	.099	-.038	-.122
4	-.085	.180	.053	-.136	-.359	.037	.017	.106
5	-.238	-.267	-.295	-.127	-.017	-.210	-.109	-.108
6	.243	.108	.119	.199	.005	.255	-.287	-.161
7	-.143	-.243	-.087	-.032	.199	-.021	-.163	-.136
8	.195	.270	.223	-.003	-.216	.218	-.150	.041

<sup>a</sup>None of the correlations reached statistical significance.

APPENDIX L

CORRELATION MATRIX BETWEEN STRANGE-SITUATION FACTORS

(TIME II) AND THE MINNESOTA CHILD DEVELOPMENT

INVENTORY (MCDI)



TABLE 23

CORRELATION MATRIX BETWEEN STRANGE-SITUATION FACTORS (TIME II)  
AND THE MINNESOTA CHILD DEVELOPMENT INVENTORY (MCDI)<sup>a</sup>

Time II Factors	MCDI Subscales							
	GED	GEM	FIM	ELA	COC	SIC	SEH	PES
1	-.018	.228	.104	.111	-.097	.129	-.234	.265
2	.084	-.088	.031	-.238	-.168	-.198	.179	.027
3	.018	-.189	-.175	.080	.044	-.270	-.024	-.339
4	.040	.119	-.027	-.213	-.081	.133	.054	-.354
5	-.070	-.123	-.208	-.126	.360	-.211	.033	-.166
6	.525 <sup>a</sup>	.525 <sup>a</sup>	.377	.202	.082	.500 <sup>a</sup>	.315	.282
7	.352	-.017	.365	.282	.242	-.042	.255	-.171

<sup>a</sup><sub>p</sub> < .05

APPENDIX M

MEANS AND STANDARD DEVIATIONS FOR THE EDWARDS PERSONAL

PREFERENCE SCALE



TABLE 24

MEANS AND STANDARD DEVIATIONS FOR THE EDWARDS PERSONAL PREFERENCE SCALE

Scale	Mean	S.D.
Achievement	12.45	4.16
Deference	11.65	2.96
Order	12.35	4.60
Exhibition	13.65	3.60
Autonomy	12.75	4.15
Affiliation	16.70	5.03
Intracception	15.15	3.82
Succorance	10.70	4.01
Dominance	9.80	5.67
Abasement	14.20	5.25
Nurturance	18.80	4.56
Change	19.15	5.83
Endurance	14.45	4.47
Heterosexuality	14.10	5.81
Aggression	12.00	4.99

APPENDIX N

CORRELATIONAL MATRIX BETWEEN STRANGE SITUATION FACTORS (TIME I)

AND MOTHER PERSONALITY VARIABLES (EDWARDS PERSONAL

PREFERENCE SCALE)



TABLE 25

CORRELATIONAL MATRIX BETWEEN STRANGE-SITUATION FACTORS (TIME I)  
AND MOTHER PERSONALITY VARIABLES (EDWARDS PERSONAL  
PREFERENCE SCALE)

EPPS Variables	Time I Factors							
	1	2	3	4	5	6	7	8
ACH	-.046	.016	-.175	.338	-.211	-.228	.226	-.297
DEF	.078	-.444 <sup>a</sup>	-.017	-.256	.556 <sup>a</sup>	-.180	.037	-.036
ORD	.547 <sup>a</sup>	.042	-.001	.071	-.192	.174	-.259	-.094
EXH	.088	.031	.341	-.116	.078	-.359	-.251	.048
AUT	.103	-.121	-.067	.356	-.404 <sup>a</sup>	-.058	-.469 <sup>a</sup>	.160
AFF	-.095	.121	-.246	.130	-.109	-.152	.037	.147
INT	.295	-.026	.015	.253	-.040	-.070	-.097	-.069
SUC	.710 <sup>b</sup>	-.098	.229	.020	-.274	-.007	-.012	-.030
DOM	.029	.495 <sup>a</sup>	.327	.107	.058	-.225	.617 <sup>b</sup>	.432 <sup>a</sup>
ABA	-.068	-.530 <sup>a</sup>	-.281	.045	-.330	-.005	-.416 <sup>a</sup>	-.444 <sup>a</sup>
NUR	-.052	-.077	.055	.324	-.072	-.008	-.135	-.081
CHG	-.144	.183	.051	.161	.064	-.224	-.235	.085
END	.191	-.189	.078	-.129	.065	-.095	-.406 <sup>a</sup>	-.218
HET	.166	-.045	-.080	.173	.383 <sup>a</sup>	-.514 <sup>a</sup>	-.068	.350
AGG	-.031	-.178	-.230	.081	.382 <sup>a</sup>	.286	.197	-.179

<sup>a</sup><sub>p</sub> < .05

<sup>b</sup><sub>p</sub> < .01

APPENDIX O

CORRELATIONAL MATRIX BETWEEN STRANGE SITUATION FACTORS (TIME II)

AND MOTHER PERSONALITY VARIABLES (EDWARDS PERSONAL

PREFERENCE SCALE)



TABLE 26

CORRELATIONAL MATRIX BETWEEN STRANGE-SITUATION FACTORS (TIME II)  
AND MOTHER PERSONALITY VARIABLES (EDWARDS PERSONAL  
PREFERENCE SCALE)

EPPS Variables	TIME II Factors						
	1	2	3	4	5	6	7
ACH	.459 <sup>a</sup>	.113	.448 <sup>a</sup>	.016	.469 <sup>a</sup>	-.462 <sup>a</sup>	.463 <sup>a</sup>
DEF	-.032	-.143	-.019	-.119	.046	-.195	-.063
ORD	-.071	.153	-.043	.133	-.146	.284	-.055
EXH	.011	-.127	.040	-.310	.018	.017	.017
AUT	-.084	.420 <sup>a</sup>	-.018	-.446 <sup>a</sup>	-.021	.082	-.079
AFF	.292	-.151	.284	-.184	.216	-.221	.299
INT	-.066	.141	-.085	-.581 <sup>b</sup>	.087	.136	-.069
SUC	-.306	.083	-.324	.300	-.314	.049	-.311
DOM	-.055	-.269	-.118	.268	-.156	-.111	-.119
ABA	-.056	.254	-.054	-.136	-.014	.211	-.048
NUR	.154	.117	.031	-.073	.082	.281	.065
CHG	.224	.022	.281	-.263	.291	-.171	.273
END	-.372	.503 <sup>a</sup>	-.375	.328	-.358	.045	-.370
HET	.160	-.185	.114	-.300	.117	-.108	.072
AGG	-.179	-.548 <sup>a</sup>	.066	.072	.073	-.023	-.002

<sup>a</sup><sub>p</sub> < .05

<sup>b</sup><sub>p</sub> < .01

APPENDIX P

CORRELATIONAL MATRIX BETWEEN MOTHER PERSONALITY VARIABLES  
(EDWARDS PERSONAL PREFERENCE SCALE) AND CHILD COMPETENCY  
DEVELOPMENT (MINNESOTA CHILD DEVELOPMENT INVENTORY)



TABLE 27

CORRELATIONAL MATRIX BETWEEN MOTHER PERSONALITY VARIABLES  
(EDWARDS PERSONAL PREFERENCE SCALE) AND CHILD COMPETENCY  
DEVELOPMENT (MINNESOTA CHILD DEVELOPMENT INVENTORY)

EPPS Variables	MCDI Subscales							
	GED	GEM	FIM	ELA	COC	SIC	SEH	PES
ACH	.146	-.173	.061	.025	.272	-.035	.314	.135
DEF	-.392 <sup>a</sup>	-.293	-.295	-.159	-.291	.086	-.221	.172
ORD	-.146	-.059	-.066	.051	-.251	.117	-.304	-.237
EXH	.101	.315	.201	.101	.000	.381 <sup>a</sup>	.312	.077
AUT	.085	-.128	.065	.075	.294	-.388 <sup>a</sup>	.149	-.064
AFF	-.447 <sup>a</sup>	-.576 <sup>b</sup>	-.473 <sup>a</sup>	-.132	-.047	-.073	-.223	-.243
INT	.465 <sup>a</sup>	.297	.318	.285	.217	.221	.046	.175
SUC	-.338	-.203	-.010	-.002	-.247	.085	-.286	-.348
DOM	.460 <sup>a</sup>	-.112	.418 <sup>a</sup>	.497 <sup>a</sup>	.447 <sup>a</sup>	-.147	.073	.121
ABA	-.300	.098	-.191	-.423 <sup>a</sup>	-.317	.134	-.008	-.208
NUR	-.401 <sup>a</sup>	-.182	-.472 <sup>a</sup>	-.287	-.265	.051	-.377	-.299
CHG	.238	.160	-.096	.003	.243	-.078	.212	.060
END	-.122	.120	-.079	-.194	-.271	-.122	-.096	.275
HET	.003	.281	.052	-.261	-.129	-.044	-.120	.167
AGG	.226	.189	.335	.322	.110	-.036	.254	.104

<sup>a</sup><sub>p</sub> < .05

<sup>b</sup><sub>p</sub> < .01

APPENDIX Q

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN THE PRESCHOOL  
EMBEDDED FIGURES TEST AND: STRANGE-SITUATION FACTORS  
(TIME I AND II), MOTHERS' PERSONALITY VARIABLES (EPPS)  
AND COMPETENCY DEVELOPMENT (MCDI)



TABLE 28

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN THE PRESCHOOL EMBEDDED  
FIGURES TEST AND: STRANGE-SITUATIONS FACTORS (TIME I AND II),  
MOTHERS' PERSONALITY VARIABLES (EPPS) AND COMPETENCY  
DEVELOPMENT (MCDI)

Factors	r	EPPS	r	MCDI	r
Time I					
1	-.346	ACH	.047	GED	-.041
2	.055	DEF	-.030	GEM	-.477 <sup>a</sup>
3	.100	ORD	.174	FIM	-.117
4	.042	EXH	-.030	ELA	.111
5	.126	AUT	.545 <sup>a</sup>	COC	.173
6	.170	AFF	.013	SIC	-.364
7	-.156	INT	-.094	SEH	-.350
8	.070	SUC	-.209	PES	-.199
		DOM	.275		
Time II					
		ABA	-.131		
1	.091	NUR	-.177		
2	-.169	CHG	.056		
3	.067	END	-.104		
4	.102	HET	-.247		
5	.222	AGG	.079		
6	-.386 <sup>a</sup>				
7	.190				

<sup>a</sup><sub>p</sub> < .05

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